ZOOARCHAEOLOGY AND SPATIAL ANALYSIS AT TEPE FARUKHABAD: NEW LIFE FOR LEGACY DATA

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Master of Arts

by
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ABSTRACT

This thesis investigates how a small village on the Deh Luran Plain of Khuzistan, Iran fits within the Uruk world during the Late Chalcolithic in Mesopotamia (3700–3300 BCE). When Tepe Farukhabad was excavated in 1968, a small assemblage of clay accounting devices was recovered. These materials connected the village to the wider culture of Mesopotamia during the fourth millennium BCE. Henry Wright, who excavated the site, positioned Tepe Farukhabad as a small Uruk outpost with administrators overseeing long-distance trade. However, studies that have sourced Uruk period clays have concluded that most devices were made with local clays, changing how we understand administrative devices to have been used and perhaps altering the standard narrative of long-distance trade. This thesis reevaluates the resources put forth as trade items, with an emphasis on animals and their products. I reanalyze the original zooarchaeological data (Redding 1981) and use Wattenmaker and Stein's (1986) and Wapnish and Hesse's (1988) models to assess the animal husbandry strategy as a producing, consuming, or a self-sufficient caprine animal economy at Tepe Farukhabad. Additionally, this research reevaluates the faunal material in terms of scale and patterning within architectural spaces during the Uruk phases at Tepe Farukhabad. This reevaluation concludes that exports of meat from Tepe Farukhabad in transregional trade were unlikely; however, secondary products were still possible export items. No clear faunal patterning emerges in the zones outlined that would indicate a closely controlled administrative enterprise. The continued presence of very young and very old caprines reflects a self-sufficient economy and not a producing economy with a well-organized administrative role.

BIOGRAPHICAL SKETCH

Polly Anna Burnette graduated from the University of Michigan-Dearborn in 2012 with a Bachelor of Arts in Anthropology. She then attended the Field School for Quaternary Paleoanthropology and Prehistory of Murcia, Spain as a scholarship recipient in the summer of 2012. After completing an internship with Melinda Zeder at the Smithsonian Museum Support Center in the Zooarchaeology Lab, where she learned basic zooarchaeological methods, she returned to the University of Michigan to continue her training in zooarchaeology. Polly Anna worked as an intern with Richard Redding at the University of Michigan's Kelsey Museum of Archaeology and with Amy Nicodemus, at the Museum of Anthropological Archaeology, as a faunal analyst. She joined Amy Nicodemus and John O'Shea, co-directors of the Bronze Age site, Pecica "Şanţul Mare," as a crew member and lab manager for the 2014–2015 field seasons in Pecica, Romania. In the fall of 2015, she started her Masters with the Cornell Institute of Archaeology and Material Studies under Nerissa Russell.

To my nieces and nephews.
My hope is that my example will inspire
them to strive for whatever they desire in this life.

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CHAPTER 1: A VILLAGE ON THE DEH LURAN REEXAMINED

INTRODUCTION

The archaeological phenomenon known as the Uruk culture is thought to have sprung up in the Mesopotamian south during the mid-fourth millennium BCE and expanded over the subsequent centuries to become the earliest colonial system in the world (Algaze 1993a; Stein 1998, 1999a, 1999b; Stein et al. 1996). The spread of cultural materials throughout the fourth and third millennia BCE, characterized by the presence of several diagnostic artifact types, takes its name from the site where the earliest and first examples were found (Algaze 1989; Foster 2009; Matthews 2003; Porter 2012). Since the discovery of the early Mesopotamian urban centers of Uruk-Warka and Susa, and the subsequent recognition of the continuity of material culture across much of the region, scholars have speculated about the relationship between these centers and their hinterlands. The approach most often explored centers on the interregional economic and social relationships these burgeoning city-states may have had with the polities of upper Mesopotamia, southeast Anatolia, and lower Mesopotamia (Matthews 2003).

This thesis investigates how Tepe Farukhabad, a small village on the Deh Luran Plain of Khuzistan, Iran (Figure 1), fits within the wider cultural system and administrative trade networks amid the shifting social reorganization taking place during the Late Chalcolithic in Mesopotamia (3700–3300 BCE). I examine village life at Tepe Farukhabad itself as well as repositioning its role in the Uruk sphere.

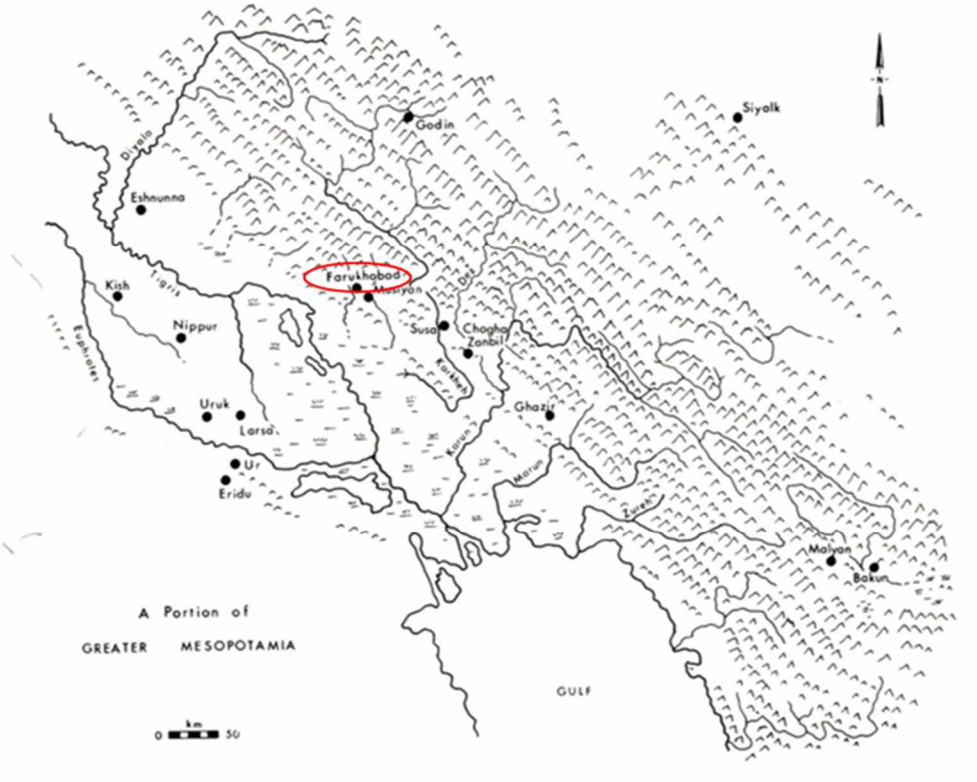


Figure 1: Map of Greater Mesopotamia (after Wright 1981)

I question and reevaluate the administrative role that the original researchers have envisioned for the village of Tepe Farukhabad by examining the faunal materials deposited in the lived spaces of households and common areas. Wright maintains that animals, after chert and bitumen, were among the most likely exports from the Deh Luran Plain. He postulates that whole animals as well as their by-products were traded transregionally. He writes, "The herds can transport themselves to other areas on their own feet, and many of their by-products— in particular hides and fibers, and dried milk products— are light and easily transported. Thus, the possibility that the considerable production of sheep and goats in Deh Luran was for export must be considered" (Wright 1981:265-266). By reevaluating the faunal patterns across distinct spaces using models developed by Patricia Wattenmaker and Gil Stein (1986) and Paula Wapnish and

Brian Hesse (1988), I attempt to glean this village's economic strategy and assess if the animal economy supports the notion of Tepe Farukhabad as an administrative center.

This tell site invites investigation as a case study in village life within the Uruk phenomenon (Figure 4). Due to the fact that the 1968 excavations were both small in scale and exploratory in nature, the site presents a few challenges. The faunal sample size is relatively small and built structures were only partially exposed (Wright 1981:275). Moreover, the minimalist approach to the recording of bone metrics limited reanalysis. This paper grapples with the challenges of using legacy faunal data, and highlights how limited datasets can nevertheless be used to illuminate patterns for new interpretation.

The objective of this study is to scale down the lens through which Uruk fauna have traditionally been viewed by using a finer-grained analysis. A close look at domestic spaces can reveal whether social and cultural trends, often presumed to be broadly practiced across the Mesopotamian region, seeped into the lived experiences of households. Studies that offer room-to-room or space-to-space analyses have been conducted with both fauna and ceramics in recent decades (Lev-Tov 2000; Panitz-Cohen 2011; Piccione et al. 2015). A high-resolution analysis of faunal patterning at a room-by-room level gives an on-the-ground view of how past peoples lived during the Uruk period, in contrast to large-scale and sweeping trends for the cultural networks at a site or region. This analysis situates the zooarchaeological findings at Urukian Tepe Farukhabad within a spatial context as well as in the wider context of the Uruk phenomenon in southern Mesopotamia and repositions its role in the Uruk diaspora.

TEPE FARUKHABAD AND THE URUK PHENOMENON

Since the discovery of sites such as Habuba Kabira, Sheikh Hassan, Jebel Aruda, and Tell Qannas, seemingly Urukian colonial settlements, scholars have been striving to understand the nature of the Uruk phenomenon. Archaeologists have witnessed the expansion of this cultural system in the spread of Urukian material culture and architectural styles throughout the Near East. Uruk materials, specifically beveled-rimmed bowls, have been found as far north as the Caspian Sea, as far east as Pakistan (Potts 2009), and as far west as Egypt (Joffe 2000; Porter 2012:69; Wilkinson 2002). These cultural changes during the fourth millennium BCE have been, and continue to be, the focus of much anthropological study as the underpinnings for the world's first urban centers and proto-states. But despite the intense growth at Uruk-Warka during this period—which would seem to point to the city as the epicenter of the cultural change—there is "little understanding of how the events themselves came about" (Porter 2012:73).

The traditional explanation of this cultural exchange imagines southern colonists taking root among their indigenous neighbors and importing their goods and lifeways to these peripheral villages, eventually absorbing the surrounding communities into their fold (Matthews 2003). The Uruk phenomenon has been widely interpreted as an expansive enterprise, with metropolitan Urukians venturing out to foster long-distance trade networks, installing colonies in regions rich in raw materials, and functioning as an early "world system" (Algaze 1993a; Stein et al. 1996; Stein1999a&b; Wallerstein 1974). Uruk-Warka was seen as the core and overseer of these cultural shifts. Supposed colonial outposts are identified archaeologically by Uruk-style artifacts recovered among the indigenous cultural material, marking a foreign presence among the native communities (Bigelow 1999; Blackman 1999; Stein 1999a).

Absorption into the system has been postulated as driven by either military force (Stein 1999b:154; Wright 1994) or peaceful exchange, but usually modeled as the subordinate supplying the dominant (Minc and Emberling 2016; Johnson 1988–89; Rothman 2001; Schwartz 2001; Stein 1999b, 2001, 2002). Urukian sites considered to be "colonies" in the Middle Euphrates are Jebel Aruda, Habuba Kabira, and Sheikh Hassan; and in the Jezira region, Tell Brak, Hamoukar, and Nineveh. In the Upper Euphrates, Hassek Höyük and Arslantepe join Hacinebi as possible colonies from the Anatolian south (Pittman and Blackman 2016).

Alternative framings of the Uruk phenomenon have been offered. Hans Nissen argues that the presence of Uruk trade outposts was an attempt to reestablish earlier Ubaid trade networks (Nissen 2001). This is supported by evidence of cultural continuity during the Ubaid and Farukh phases across sites on the Deh Luran Plain (Hole et al. 1969; Wright 1981). Nissen's theory still places trans-regional trade as the explanation for shared culture throughout the region.

The presence of Urukian influence was manifested in Tepe Farukhabad's artifact assemblage. Among the Uruk-type artifacts recovered from Tepe Farukhabad, beveled-rimmed bowls, conical cups, Uruk-style jars, clay stoppers, and one confirmed ceramic cone typically used in the decoration of Uruk architecture were found throughout the structures (Wright 1981: 91–137, 136–165). The cone found at Tepe Farukhabad resembles those decorating public buildings at Uruk-Warka and 'Uqair in mosaics (Henry Wright, personal communication 2019). The wall cone[1] and "embellishments" on large structures were recovered from Uruk layers

[1] At Tepe Farukhabad only a single cone was found. For this reason and because the cone in the Tepe Farukhabad assemblage was battered, Wright is hesitant to say the purpose was decorative (Henry Wright, personal communication 2019).

(Wright 1981). These materials, in addition to a small corpus of administrative devices discussed at length below, placed Tepe Farukhabad within the Uruk world.

Therefore, Tepe Farukhabad similarly has been situated as an Uruk outpost (Moghaddam 2012; Wright 1981: 188, 272, 275) and is described as "the only center on the plain, a tiny outpost of some larger polity" (Wright 1981: 275). As the plain was located between the highlands and the lowlands, it is a reasonable place for a trade route and was therefore conceived as an outpost on the way to Susa (Wright 1981:1). Yet, Susa was the closer neighbor. Frank Hole, Kent Flannery, and James Neely (1969), as well as Henry Wright (1981) have connected the ceramic tradition of the Deh Luran Plain with Susa to the east, starting in the Ubaid period. Ceramics at Tepe Farukhabad were "almost indistinguishable" from the Late Uruk ceramics at Susa and Uruk-Warka except for the beveled-rimmed bowls, which had some differences (Wright 1981:188).

A shift toward local, intra-site exchange has been proposed in opposition to, and in addition to, an emphasis on long-range exchange routes (Blackman 1985, 1999; Pittman and Blackman 2016). For example, Stein and others have argued that Hacinebi was an Urukian colony in southern Anatolia (Bigelow 1999; Blackman 1999; Stein 1996, 1999a). Uruk cultural material at Hacinebi was found to be localized and distinct yet did not replace Anatolian styles. Stein maintains that the local Anatolians retained power and peacefully allowed the Urukians to live alongside them in a separate area of the town (Stein 1999a). The southern presence was one of cohabitation rather than dominance. The Uruk transplants were there to facilitate exchange in these entrepôts (Stein 1999a). Stein's interpretation of Hacinebi provided an alternative view of colonies— one that differed from Algaze's "world systems" model, in which an Uruk colony was seen as exerting power and influence over the indigenous communities. In line with critiques

of world system theory (Foster 2009:53), Stein's analysis of findings at Hacinebi Tepe challenged the assumption that the core always dominates the periphery in terms of economics, ideology, and technology.

Initial interpretation saw Tepe Farukhabad as a declining small administrative center until the end of the Late Uruk period. In the Middle Uruk, the settlement began to "wither away" (Wright 1981:188). In the Late Uruk, the population declined on the plain, and what remained was a small and isolated Uruk outpost. Wright (2013:60) remarks:

> While we have little evidence of the social or political organization of Deh Luran communities at the time, we can infer a small local hierarchically organized settlement group in an uneasy existence between much larger neighbors to the south-west and south-east.

But why must an "uneasy" relationship with larger neighbors, meaning Uruk and Susa, be inferred? As a major Uruk urban center, and the city closer to the Deh Luran Plain than Uruk-Warka, Susa is often regarded as a major source of cultural influence in the region[2]. Wright (2013:68) considers Susa as the city-state that dominated the Deh Luran Plain but admits: "Whether control was exerted [on the Deh Luran Plain] from Mesopotamia or Susiana we cannot say."

[2] The salience of Susa in the development of the Uruk phenomenon and the growing unease with the presumed preeminence of Uruk-Warka is beyond the scope of this thesis. Suffice it to say that, the emphasis on the south has been Uruk-centric and there may have been two or more competing or cooperating states, with Susa the most likely rival to Uruk-Warka (Flannery and Marcus 2012:459; Nissen 1985). Porter (2012:88) has posited Susa and Abu Salabikh as part of the "heartland of the culture that characterized Uruk." In the same vein, Robert Braidwood (1974:79) has remarked, "I am haunted by the specter of how for years afterwards quite accidental priorities of discovery may influence culture-historical generalization," and Foster (2009:46) has wondered whether we would be discussing the "Brak Phenomenon" had Tell Brak been excavated first. The stratigraphy of Uruk-Warka has unfortunately been compromised to the point that a sequence cannot be established at the type-site for which the cultural phenomenon was named (Eichmann 1989; Pittman 2013:296; Sürenhagen 1986). Fortunately, Susa's stratigraphy is preserved; levels at Susa correspond to Uruk IV, where the first bullae and numerical tablets emerge at Uruk-Warka (Brisch 2013; Van de Mieroop 2007:29).

Wright (2013) notes Susa's place of power and influence on the Deh Luran Plain and concludes that there was evidence for a tribute system as well as a "balanced economic exchange" (Wright 2001:141–143, 2013:65–66). He contends that the people of Tepe Farukhabad may have been "independent agents in a larger economic network" when it came to exported goods, but that there may have been "extraction with very little reciprocity" and that Tepe Farukhabad "received little in return" (Wright 2001:140). He goes on to conclude: "If there is some evidence for more balanced forms of exchange, there is also evidence that important economic sectors were administered as command economies, in which mass labor was organized and sustained with rations, and in which goods were exacted as tribute from producers" (Wright 2001:141). Whether from the south or the east, Tepe Farukhabad is still positioned as a subordinate to one or both of these urban centers. And if said influence came from Susiana, as is now suspected, Tepe Farukhabad can hardly be seen as the periphery given that it is a close neighbor to Susa (Wright 1981:264). The question for Wright and others was not so much whether Tepe Farukhabad was under the influence and control of an urban central power, but how. In a world systems framing, the periphery was always supplying the core at a loss to themselves (Sella 1977:31; Stein 1999b:157).

ORIENTATION TO TEPE FARUKHABAD AND THE DEH LURAN PLAIN

Tepe Farukhabad is a mound on the central Deh Luran Plain (Figure 2). The closest contemporary sites were Musiyan and Susa, a day's journey to the southwest (Wright 1981:264). The Deh Luran Plain is located in southwest Iran, south of the Mehmeh Plain. It sits between the Mehran Plain and the Susiana Plain in the southern Mesopotamian foothills of the Zagros Mountains of Pusht-i Kuh (Abdi 2001:247). The Deh Luran was on the main route from lower

Mesopotamia to the Susiana Plain; it was unavoidable in transit between the regions (Wright 2013:61).

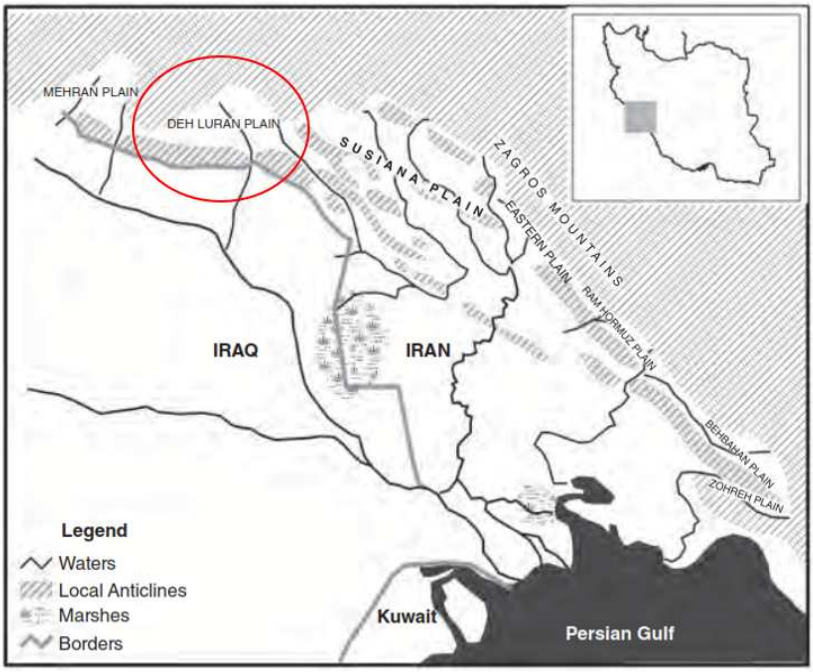


Figure 2: Map of the Plains of Mesopotamia (after Moghaddam 2012)

Jacques de Morgan first surveyed the Deh Luran Plain in the late 19th century (Abdi 2001). In 1903, French archaeologists Joseph-Étienne Gautier and Georges Lampre initiated archaeological research, with test trenches at Tepe Musiyan, Tepe Khazineh, and Tepe Mohammad Djaffar, also called Ali Kosh (Abdi 2001; Hole et al. 1969:8–9). A French archaeological mission excavated again from 1934 to 1939 at Tepe Jaffarabad and elsewhere in the Khuzistan region (Hole et al. 1969:9). In 1962, Robert Adams documented sites on the Deh Luran Plain, and throughout the Near East, in his expansive survey of the region for the Oriental Institute at the University of Chicago (Adams 1962). Hole, Flannery, and Neely surveyed the

Deh Luran Plain more extensively in 1961 and 1963, confirming many of Adams' hypotheses (Hole et al. 1969:9).

Hole et al.'s (1969) work established a stratigraphic sequence (Table 1) and constructed an environmental history for the region upon which future projects could build. The resulting report laid the groundwork for Wright's 1968 excavation at Tepe Farukhabad, which, along with Chagha Sefid, was targeted by Hole et al.'s report for future exploration (Hole et al. 1969:3). Pierre De Miroschedji (1981) was the last archaeologist to visit the Deh Luran Plain before excavations abruptly stopped due to the Iranian Revolution. Kamyar Abdi (2001) returned in 1997, reporting on the post-conflict status of sites. And most recently, Mohsen Zeynivand (2017) surveyed the Deh Luran, conducting a surface collection of Paleolithic bifaces at Golsiri.

Occupation at Tepe Farukhabad spans the Ubaid period (represented by Bayat and Farukh pottery) through to Transitional Elamite periods (Table 2). The site's ceramic chronology consists of Bayat, Farukh, Uruk, Jemdet Nasr, Early Dynastic, Simaski Elamite, Sukkalmahhu Elamite, and Transitional Elamite. These phases align with Susiana pottery sequences (Wright 1981:10, 23–42; Potts 2012).

Table 1: Dates for the Archaeological Phases of the Deh Luran Plain
(Hole 1977; Hole et al. 1969; Neely and Wright 1994; Potts 2012; Wright 1981)

Dates of Deh Luran Plain Phases	
Late Uruk	3500-3300 BCE
Middle Uruk	3700-3500 BCE
Early Uruk	3900-3700 BCE
Saragabrab	4000-3900 BCE
Farukh	4400-4200 BCE
Bayat	4600-4400 BCE

Table 2: The Archaeological Phases of Tepe Farukhabad, by Trench and Excavation Level (Wright 1981:6)

Phases at Tepe Farukhabad			
Phases	Excavation A	Excavation B	Excavation C
Transitional Elamite		1-11U	
Sukkalmahhu Elamite		11L-14	
Simaski Elamite		15-18	
Early Dynastic	1-5	19-20	9-23
Late Jemdet Nasr	6-12	21-23	24-26
Early Jemdet Nasr	13-17	24-27	27-31
Late Uruk	18-20	28-31	32-33
Middle Uruk	21-22	32-34	
Early Uruk		35-36	
Late Farukh	23	37-39	
Middle Farukh	24-29	40-45	
Early Farukh	30-31	46-47	
Bayat	33-36		

Note: Layers were divided by natural strata and then arbitrary layers within strata 15cm or larger.

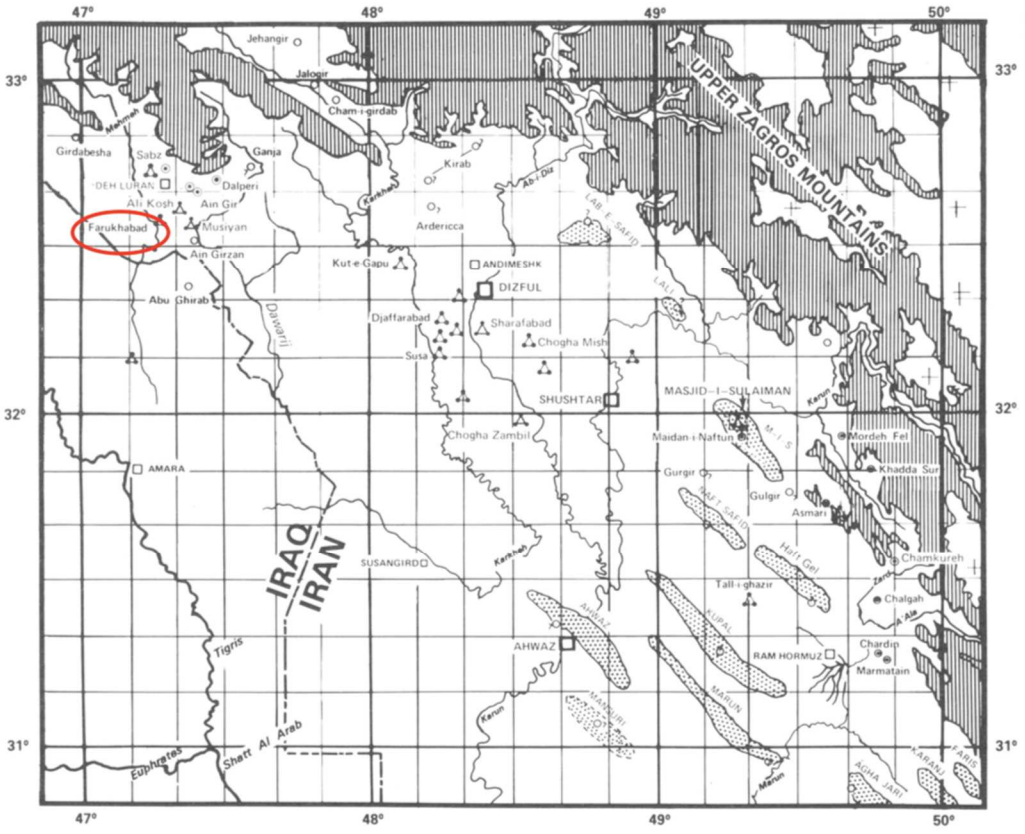


Figure 3: Map of Uruk Period Archaeological Sites (after Marschner et al.1978)

SITE BACKGROUND

The tell measures 190 meters from the northwest to southeast and 140 meters from the northeast to southwest. The mound slopes steeply, giving a lopsided and bulbous appearance when viewed from a distance (Figure 4). The center of the mound reaches the heights of 30 meters above the Mehmeh Floodplain and 25 meters above the ancient floodplain due to the eroding of 5 meters into the alluvium (Wright 1981:4; Henry Wright, personal communication 2018). The floodplain is deeply incised and at its lowest level is 20 meters above the sterile soil (Wright 1981:4). Two step trenches were cut along the southwest side of the mound (Trenches A and B) and a third (Trench C) was positioned atop the tell (Figures 5 and 6). Trenches A and B reached the depths[3] of the Ubaid periods (Table 2). Trench C included only phases from the Early Dynastic to the Late Uruk (Table 2); those materials are excluded from this analysis.

Figure 4: View of Tepe Farukhabad Tell in Khuzistan, Iran
(photograph by Henry Wright, used with permission)

[3] Trench A had a total depth of 8.2 m, Trench B 11.9 m, and Trench C 12.0 m (Wright 1981:7).

Architecture cuts through Trenches A and B. The trenches slice through structures without horizontally exposing an entire neighborhood layout. Wright (1981:5) reports that though arbitrary, the trenches may have biased the excavation towards larger buildings. The presence of artifacts for crafts such as bone awls, stone and bone scrapers, drills, perforators, whorls and discs, as well as items for adornment, such as carnelian beads, a single agate bead, and a glass bracelet (Wright 1981: 136–165), suggest multi-purpose households and work spaces. Wright describes buildings as "simple" or "elaborate" through the Uruk to Early Dynastic phases. Wall thickness marks the distinction between simple or elaborate buildings.

Large buildings were designated by brick size and thickness as well as a unique bonding method, with well-preserved plaster and infrequent embellishments added, whereas small buildings were designated by poorly laid smaller bricks and thin walls (Wright 1981:84). Wright (1981:83) designates rooms with letters and features within these rooms with numbers. The excavations uncovered five small buildings and one large building in Trench A, and four small buildings and five large buildings in Trench B. Relatively small bricks dominate, and floors were made of silt. The structures date to the Uruk, Jemdet Nasr, and Early Dynastic Periods. Villagers dwelling or working in these buildings during the Uruk period may have altered or added onto earlier structures. Excavators screened sediment through 1/5-inch mesh dry screen, except for the material from wall cleaning or confirmed animal burrows (Wright 1981:6). Most materials were wet screened through a 1/4-inch mesh; fewer were floated. Bone was recovered from a 1/16-inch mesh and others were hand-picked though troweling (Henry Wright, personal communication 2017).

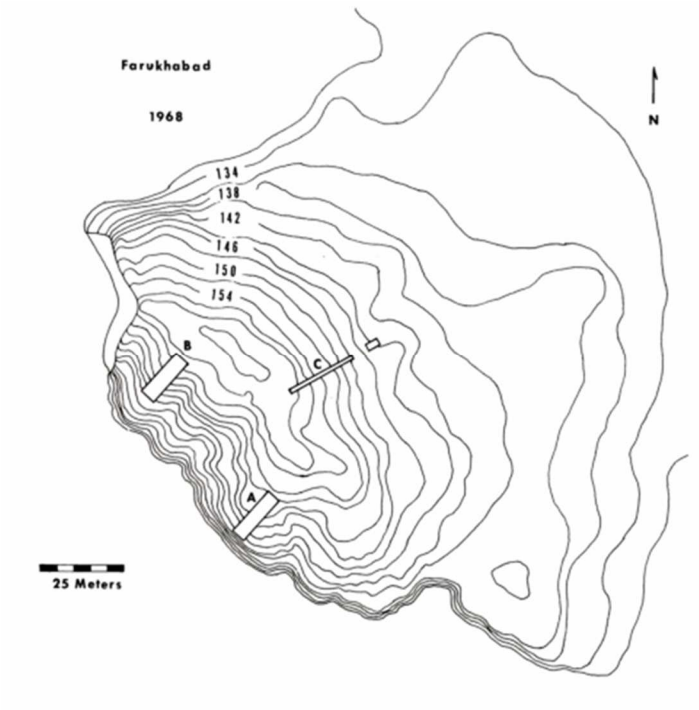


Figure 5: Topographic Map of Tepe Farukhabad Tell, Showing Trenches A, B, and C (from Wright 1981, used with permission)

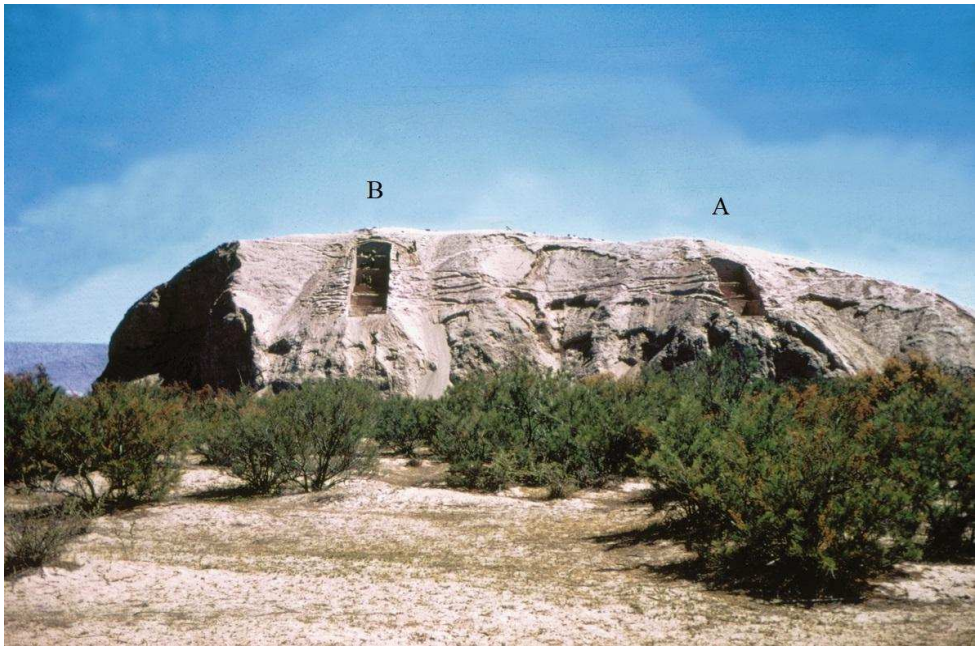


Figure 6: View of the Excavations of Trenches A and B, from the Southwest Side of the Tell (photograph by Henry Wright, used with permission)

Redding (1981) analyzed the hand-excavated faunal material directly; no presorting took place before arrival to the lab. Loss of small bones from fish, rodents, and lizards in the screening process likely biased the sample (Grayson 1981; Payne 1975; Redding 1981:233). Cut marks, burning, and other modifications were noted. The locations of modifications on a bone were not recorded; only their occurrence. Weathering, digestion, and fragmentation (aside from noting if from a distal/proximal end) were not noted. Pathologies were noted, but not the type or location on the bone. Carnivore gnawing was not observed on bones from this assemblage, despite the presence of canids in the village (Redding 1981:243). Rodent gnawing was noted, but not the location on the bone.

When Redding conducted the faunal analysis, several methods that are standard today were not widely in use. At the time of his analysis, Redding utilized five elements (bone or body part), to differentiate between sheep (*Ovis aries*), goat (*Capra hircus*), and gazelle (*Gazella subgutturosa*): petrous-temporal, horn core, calcaneus, distal condyles of metapodials and the third phalanx[4] (Redding 1981:245). Otherwise, Redding lumped these taxa in the category *Ovis/Capra (O/C)* with the assumption that most bones were either sheep or goat. This is common practice for elements that cannot be distinguished between sheep and goat (Boessneck 1969; Boessneck et al. 1964; Cornevin and Lesbre 1891; Gromova 1953; Kratochvil 1969; Payne 1969; Reed 1972; Schramm 1967). I lump caprine and sheep-sized fauna as *O/C* for this analysis.

[4] At the time of the publishing of the field report, Redding no longer believed that using the third phalanx was reliable for separating sheep from goats. However, the identifications are included in field report's (Wright 1981) appendices, but not included in his calculations (Redding 1981:245). They are included in the entering of the handwritten data into FileMaker Pro, but not used for this research. I changed these identifications to "*O/C" (Ovis/Capra)* when making charts and graphs for this thesis.

The standardized measurements developed by Angela von den Driesch (1976) were not recorded. When measurements were taken, they represented an unstandardized method that reflected the personal decision of the analyst. I disregard these, as such measurements have lost their relevance with the advent of standardized measuring methodology (Richard Redding, personal communication 2016). Measurements for distal ends of metapodials, for the purpose of differentiating between sheep and goat (Boessneck et al. 1964; Redding 1981:246-247), are the only measurements still valid. There is very little information on aging aside from fusion and the imprecise notation of tooth wear (wearing, worn, very worn). I assign age range by fusion and less precisely by tooth wear (Meadow 1978; Silver 1969; Zeder 1985, 1991, 2006).

SUBSISTENCE ECONOMY ON THE DEH LURAN PLAIN

At the time Wright wrote the field report, in the late 1960s, people used the plain for animal herding and grazing rather than for cultivation; this is assumed to be how it was used in the past as well. Wright judges that 59% of the upper slope and basin favors grazing, with 34% being alluvial fan and floodplain, and 7% being suitable for agriculture (Wright 1981:64). During the Uruk phases, it is unclear whether the plain was a common space where the community freely drove their flocks, either individually or collectively, or whether pasturage was somehow managed and controlled.

Naomi Miller's (2011:2-3) botanical assessment of the Deh Luran Plain supports the supposition of a largely pastoral economy. She concludes that of the four sites on the Deh Luran for which she evaluated seed deposits, "Farukhabad had the highest amount of wild seeds relative to cereals, which suggests an emphasis on pastoralism over agriculture [on the plain]" (Miller 2011:5). Additionally, she found that agriculture dependent on rainfall was "marginal at best" at the Deh Luran sites of Farukhabad and Sharafabad. This is consistent with ethnohistoric

reports of past environmental conditions, which emphasized that pastoralism has always been important on the plain (Miller 2011; Whyte 1977).

The ubiquity of teeth and foot bones indicates that butchering likely took place in the village (Redding 1981:251; Wright 1981:65,190). Villagers killed animals on-site but butchering and cooking locations remain unknown. Sheep and goats clearly were the primary focus of the Farukhabad economic strategy across the Uruk phases.

URUK ZOOARCHAEOLOGY

Research concerning the evolution of complex societies, centralized administration, and the development of urbanization dominated early Uruk archaeology (Crabtree 1990). Zooarchaeological research in the Near East generally corroborated the findings of those studies. Elucidating husbandry strategies and animal economies is a mainstay in ancient Near Eastern zooarchaeological research programs, and often is the starting point of any faunal report. Some researchers have focused on subsistence and secondary product strategies (Payne 1988; Redding 1981), and later, fauna was used for determining distinct ethnic populations and colonization (Stein and Nicola 1996). Economic and social status has been another concern of zooarchaeological studies (DeFrance 2009; Wattenmaker 1994), and diachronic and regional comparisons of faunal assemblages identified changes in faunal strategies starting in the Late Chalcolithic throughout Mesopotamia (Ashkar 1995).

Wright, Miller, and Redding (1981) examined an Uruk period trash pit at Sharafabad and combined stratigraphy, ceramics, and culling patterns to identify the site as a seasonal settlement as opposed to a permanent urban center. Foster (2009) conducted a holistic study of households at Kenan Tepe and gave special attention to zooarchaeology. Household archaeology and micro-scale investigations tell us how households and communities experienced the Uruk expansion. Piccione et al. (2015:19) looked at the materials from the Anatolian site of Arslantepe, focusing on fauna, botanicals,

ceramics, and lithics by room to construct the economy of the structures. A clear differentiation between the areas reveals spatial patterning, and specific data sets appeared to have complementary functions. Foster (2009) notes that, these studies notwithstanding, analysis at the household level and intra-site comparison is notably lacking in Uruk zooarchaeology.

The reliance on caprine husbandry for subsistence in the Near East began in the Pre-Pottery Neolithic B period in southern Anatolia and was well established by the fourth millennium BCE throughout the Fertile Crescent (Arbuckle 2012). Villagers shifted away from hunting and toward pastoralism, and in the lowlands, people eventually relied on butchers to obtain meat during the fourth millennium BCE as settlements became more urbanized (Ashkar 1995; Grigson 2007). Caprine and cattle flocks became state-controlled in many parts of Mesopotamia (Arbuckle 2015; Ashkar 1995; Grigson 2007; Price and Evin 2017; Waetzoldt 1972:14–17; Wilkinson et al. 2014:58; Zeder 1994). Northern settlements retained higher frequencies of wild taxa into the fourth millennium BCE than southern Mesopotamian sites, although there were lower levels of wild taxa than previously seen in the Neolithic and Early Chalcolithic. Ashkar (1995) asserts that this higher use of wild taxa is likely due to the northern sites' ability to retain some independence from adopting the south's dietary practices. Kent Flannery and Joyce Marcus (2012:464–472) likewise suggest that northern Mesopotamia was able to maintain its own identity.

An influx of caprines at Hacinebi is thought to represent a southern presence (Bigelow 1999; Stein and Nicola 1996). Ashkar (1995:122) saw the shift to caprine dependence as a result of administration. She reviewed the faunal reports of nine Uruk period sites and ranked them in relation to presence of Uruk-type artifacts and faunal patterning to identify trends in animal economies across the Uruk world. She concluded that "perhaps a reliance on [caprines] is a

general pattern of centralized organization of food production, rather than a pattern of the Uruk system." In other words, caprine management coincided with complexity rather than colonization.

A by-product of the process of urbanization in the Near East seemed to be a shift toward an overwhelming dependence on caprines. Melinda Zeder (1988:12) has suggested that in an urbanized center, people's access to a wider range of taxa decreases; there was a distancing between herds and consumers. As a result, there would be fewer taxa represented in urban faunal assemblages (Crabtree 1990:160). However, this is not universally or cross-culturally applicable when considering fauna from historic periods or from North American contexts (Reitz 1986).

The exchange of meat and animal products between the urban centers and the hinterlands has been a focus of Near Eastern zooarchaeological studies as well (Crabtree 1990; Maltby 1985:63; Wattenmaker 1987; Wattenmaker and Stein 1986; Zeder 1984:284–285). That theme shapes this study. I reevaluate Tepe Farukhabad as a supplier of animal products to urban centers, as was originally proposed (Wright 1981). When studied initially, the faunal record of the excavated trenches was generalized to the entirety of the site, and animal management strategy was considered in the context of trade. The present study, in contrast, situates animal exploitation in the home and the spaces of the people who lived in the structures excavated. I look at how animals were being used at Tepe Farukhabad at a small scale, and I update the aging data using Zeder's (2006) methodology.

Figure 7**:** View of Tepe Farukhabad, from the South, with Sheep in the Foreground (photo by Mohsen Zeynivand 2017; used with permission)

CHAPTER 2: LEGACY DATA REVISITED

METHODOLOGY

I converted the original handwritten data from the faunal analysis conducted by Redding into a FileMaker Pro database. This study examines the lived and household spaces of Uruk period people, and to achieve this I look at separate areas within a phase individually. The data from the Uruk phases were isolated, quantified by the Number of Identified Specimen (NISP), and separated by color-coded spatial zones within a level. NISP is a method of quantification that uses the identification counts for determining the ratios and patterns of taxa or the elements present at the site. The advantages of NISP are that it is easy to calculate and is additive (Payne 1975; Watson 1979). However, NISP can bias an assemblage toward taxa with more bones. Further, the accuracy of taxa proportions can be obscured by differential fragmentation (Grayson 1984; Klein and Cruz-Uribe 1984; Marshall and Pilgram 1993; Watson 1979). Many early faunal

assemblages from the Near East suffered from low sample sizes, poor recovery practices, loss of material, or a failure to collect (Ashkar 1995; Payne 1988).

Minimum Number of Individuals (MNI), the second most common quantification method used in zooarchaeological studies, was used by Redding in the 1981 analysis (Redding 1981:233). MNI uses the most commonly occurring bone to calculate the lowest number of individuals present at a site (Klein and Cruz-Uribe 1984; O'Connor 2000; White 1953). MNI can exaggerate the proportion of a rare taxon, is sensitive to aggregation errors, and is not additive. An additional problem with MNI is that researchers have not established a standardized way to calculate it. How the MNI is calculated for a site (by level, pit, house, or for the entire excavation) will change the counts (Watson 1979). The selection of quantification methods is dependent on the goals of the study. Pam Crabtree (1990:159) has concluded: "it is probably fair to say that there is no single technique that can adequately and unambiguously measure the relative proportions of the animal species present at an archaeological site." NISP is preferable for a study such as this where smaller contexts are compared. MNI was deemed inappropriate as the sample size is small overall for the Uruk phases, especially when divided into Early, Middle, and Late phases, and even further when separated by the zones of each level. Calculating an MNI for the zones outlined in this study would make comparisons between zones difficult, if not impossible, and would assume that the remains of individuals were not spread across zones.

I marked off the Uruk phase drawings into colored zones and coded them with numbers for comparison with each other. Rooms, walls, and outside spaces were chosen for demarcation of zones and were coded. Sometimes the zones are clearly inside of a room, other times they are

more ambiguous spaces separated by walls. Bones found in an ambiguous space that straddles a wall, or in two zones, were excluded from my analysis.[5]

I made NISP charts for each phase examined and then narrowed further to the color-coded zone. I noted patterns with clustering of taxa and elements. Bones that could not be identified to a particular taxon were excluded. All caprine and sheep-size bones were combined under the category *O/C (Ovis/Capra).* I included non-faunal artifacts in the analysis to provide greater context for spaces. Bone fragments that could be sided were aggregated to look for patterning for a preference in a side of the body or meat cut in a color-coded zone.

Redding (1981) distinguished between the sheep and goat by the dense yet non-meaty bones. These tend to be more often preserved in the archaeological record due to density whereas thin bones experience more attrition (Grayson 1984; Lam et al. 2003; Nicholson 1996), and therefore appears to bias body part distributions toward "bone waste." Nerissa Russell and Louise Martin (2005:46-47) address body part distribution at Çatalhöyük and were able to correct, that though cattle may have had symbolic value at Çatalhöyük, they did not have the predominance in presence at Çatalhöyük once though. Feet bones, carpals, and tarsals appear most frequently in the skeleton and may give the appearance of dominating an assemblage. This needed to be controlled for at Tepe Farukhabad as well. The simplest way to control for body part distribution is to divide the NISP by the number of times that bone occurs in the body. This accounts for how many times a bone will occur in an individual and counters the impression that there is an influx of species or element because of apparent frequency (O'Connor 2000:71). When this check was performed on the carpals, tarsals, and phalanx NISP counts, an influx of

[5] The way bone bags were labeled and fit into trench grid sometimes resulted in ambiguity about which side of a wall bones were found on. The bones were excluded in these instances.

waste bones was not observed. No more than what you would expect in an individual was ever recovered in any single zone throughout the Uruk Phase at Tepe Farukhabad.

Redding's original faunal analysis recorded fusion for many bones. A relative age range could be determined for many mammal limb bones in the color-coded zones. Redding's analysis notes when a tooth was unerupted, erupting, unworn, wearing, or very worn. This loose notation gives a relative idea of the individual's stage of life at death but is not as precise as the standardized methods now in use.

I use Zeder's (2006) study, which refined aging techniques for sheep and goats. She used wild sheep and goats from Iran and Iraq, which would more closely resemble the way the animals found archaeologically would have lived. Previous studies on aging found that there is general agreement on aging sequences, but less agreement for the timing of epiphyseal fusions. In earlier studies, the sequence, timing, and even the bone group can vary; Zeder's study attempts to clarify this. Controlling for differences in sex and castrates, samples were separated into four different fusion states: unfused (U), early fusion (J), late fusion (L), or fused (F). Zeder's study found that there are six aging groups, and not four as with the earlier convention. Zeder adapts her 1985 and 1991 tooth wear system to align with Grant (1982) and Payne (1973). Using Zeder's (2006) system, I was able to put the tooth wear at Tepe Farukhabad in closest age range without reevaluating the teeth directly (Appendix Table 29-31). I used Richard Meadow's (1978) coding system to record tooth eruption (Appendix Table 32). These calculations are presented in tables 29-32 in the appendix; these were then used to create age range approximation charts for each phase and zone and can be seen in tables 4, 6, 8, 10, and 12.

The presence-absence of taxa and elements, siding, and aging patterns were aggregated to better understand the relationship between the people living in this village and meat,

provisioning, and trade. The sex of animals at Tepe Farukhabad was not available. As far as the data recorded allowed, I assessed culling patterns for the likelihood of wool and hide production. I then viewed these lines of evidence though a small-scale spatial analysis.

I used Wattenmaker and Stein's (1986) model, which was modified by Wapnish and Hesse (1988) to evaluate the degree to which animal husbandry derives from a self-contained or a specialized economy. Wattenmaker and Stein (1986:91) outline four trends in faunal remains:

> (1) The relative abundance of different domestic species. (2) Age composition of each species as an indicator of pastoral production strategies. (3) Comparison between contemporaneous sites to examine exchange patterns. (4) Examination of the distribution of animals within [a site] in order to detect patterns of intercommunity production and distribution.

Wapnish and Hesse (1988) expand on Wattenmaker and Stein's model by codifying the self-contained, consuming, and producing village typologies. Aging data form three profiles to identify patterns of production and consumption; these models attempt to assess the relationships between towns and villages.

By Wapnish and Hesse's rubric, a **producing economy** more often contains neonates and the very old (that have died from natural causes), and there would be a higher rate of deformed and infirmed individuals as this population more reflects the profile of a natural herd. This profile reflects the meat source of locals as the market-age animals would be reserved for trade to the consuming core. The **consuming economy** profile would then contain a majority of the market-age animals obtained through trade from the periphery and would mostly be caprines between 1.5 and 2.5 years of age with few surviving into old age or kept for reproducing. And a **self-contained economy** would reflect a harvesting profile where animals were raised and

consumed locally. This would include a wide breadth of ages in the herding population and would result in a mortality profile of a typical domestic herd (Crabtree 1990:162; Wapnish and Hesse 1988:84). I applied the survivorship curves at Tepe Farukhabad from the aging data available to these rubrics outlined.

CHAPTER 3: RESULTS
URUK SPACES AND FAUNA ANALYZED

I do not want to overstate the significance of where faunal material lay or ignore the depositional history of a site by presuming a "Pompeii premise" (Binford 1981; Diehl 1998; Schiffer 1985). The faunal materials found at Tepe Farukhabad may not reflect the people who lived inside the space directly, but they certainly convey a pattern of consumption for the people living in the vicinity generally. Michael Schiffer (1975:838) explains that,

> The archaeological record at a site is a static, three-dimensional structure of materials existing in the present. The remains in this site have undergone successive transformations from the time they once participated in a behavioral system to the time they are observed by the archaeologist. These transformations are effected by the cultural and noncultural formation processes of the archaeological record.

A cultural example of this is how trash was discarded. Abandoned spaces were often used to dump waste. It is possible some of the zones reviewed at Tepe Farukhabad reflect neighboring spaces and not the zone where they were found (Tringham 1995; Wapnish and Hesse 1988). Tringham (1995:85) describes the depositional challenges with household archaeology when she wrote:

> We could assume, as has so often been done in the past, that the house full of artifacts was the center of domestic activity… and that the emptier floor represents a house that was abandoned, or even was "poorer." Alternatively, the

> artifacts on the floor might be placed there deliberately, as part of an intentional act … or floor space of an abandoned house might be re-used in the garbage disposal of a later neighboring house, and the latest house might be the one with few artifacts on its floor.

Wapnish and Hesse (1988:55) address concerns about the correlation between faunal remains from rooms and the lives of those who lived in that space at Tell Jemmeh, a Middle Bronze Age site in the Levant. They found that compact layers of middens were more typical of a community waste disposal area rather than a household; by the same reasoning, Tepe Farukhabad's step trench levels likely constitute domestic spaces not abruptly abandoned but lived in until abandonment in the later Elamite phases. Wapnish and Hesse (1988:85) considered the ceramics and other domestic artifacts in conjunction with the faunal remains to determine if the deposits "represent the garbage of only one atypical slice of a whole society."

Using their rubric, Tepe Farukhabad's deposits also seem to reflect abandoned structures rather than a makeshift midden. Phase levels at Tepe Farukhabad contain typical pottery and items for a household or residential courtyard. These items include beveled-rimed bowls, of which two leading theories for their function—a disposable "paper cup–like" function or bread molds (Porter 2012; Potts 2009)—are both domestic in nature. Other domestic artifacts include the spindle whorls found in Early Uruk and Middle Uruk contexts as well as scrapers, awls, drills, perforators, and woven artifacts found on the floors of each level (Wright 1981:147–160; 382–387).

Wapnish and Hesse (1988:90) identify another challenge: the problem of interdependence. One age-class may be represented by several bones from a single individual. Yet another age-class may be represented by only one fragment from one animal. If several

elements from the single animal are counted separately, the age distribution will be skewed. Calculating the MNI would have controlled for the problem of interdependence[6]. However, MNI was not used in this analysis for the reasons explained above. A future reanalysis of the physical bones would clarify this issue and strengthen the aging profiles by updating with the more precise age methods mentioned above (Grant 1982; Payne 1973; Zeder 2006).

This section summarizes the findings within each step trench level excavated from the Uruk phases. The deposits analyzed come mostly from bone that came out of the floors of structures, their neighboring spaces, or from pits associated with structures. Meadow (1991:97) explains, "contemporary deposits inside of and outside of buildings need not be at the same absolute elevations, and it is often impossible to demonstrate stratigraphically the precise relationships between such deposits." This is the case for Tepe Farukhabad's structures. Inferences are made as a best approximation from the bones' depositional state. These spaces are by-and-large understood as domestic and the trash associated with them is supposed to be of a domestic nature.

In my analysis, at times I refer to phases that came before or later and may have built upon or cut through Uruk structures (Table 2). I describe the faunal patterning and the contents of each level excavated by trench, level, and phase. I describe the faunal finds in each zone outlined and I include the artifact analysis alongside the faunal patterning for the full context of the space. The total identifiable bones per taxon is divided by the total bones recovered in the step trench level; the percentages are presented in pie charts with the images of the zones and their codes (Figures 8, 9, 11, 12, and 13). The NISPs by zone are included in the appendix.

[6] However, MNI introduces new problems by contributing different individuals from the same age class to an MNI count. Several animals could account for only one individual by this method— which also would skew the age distribution. A way to fix this would be to use a single element that can be aged (e.g. a left mandible), but this may be hard to achieve with a small assemblage.

EARLY URUK SPACES

Early Uruk: Trench B

Only one unit, Trench B, reached the Early Uruk phase (Table 2). One clearly defined "small room with stone footing" with cobblestone walls cuts diagonally through the middle of the excavated Early Uruk level from east to west (Wright 1981:78). It is unclear if the exposed areas adjacent to the main room are additional rooms, alleyway, or outside space. Postholes with fired clay lining were found with no brick, and because of this, the structure was interpreted as a tent-hybrid similar to those used by the Luri herders of Iran (Cribb 1991:216; Wright 1981:78). Within the structure, two shallow hearths were uncovered, one in an earlier floor than the other. A beveled-rimmed bowl was found on the floor and a fine jar of Sargarab Ware was found in a posthole (Wright 1981:78).

I coded the exposed room as UA2-blue. The adjacent triangular areas around the room were color-coded clockwise as zones. The boundaries for these zones are the cobble walls of the room. I code them as follows: UA1-orange, UA3-green, and UA4-yellow (Figure 8). Within UA2-blue, a broad range of taxa appear: sheep-goat (*O/C*; referred to as caprine henceforth), cattle (*Bos sp.*), onager[7] (*Equus hemionus*; referred to as *Equus*), and dog (*Canis sp.*; referred to as canid below).[8] Since the UA2-blue zone is the largest space outlined, the richness of taxa (Table 3) could merely be a function of sample size (Cruz-Uribe 1998; Grayson 1981; Grayson 1984:138; Payne 1975).

Caprines dominate all of the zones in all phases of both trenches in this village—as is seen in animal husbandry patterns throughout the Near East from the fifth millennium BCE

[7] Redding (1981:244) identifies all *Equus* as half ass or *E. hemionus* before the Elamite phases.

[8] Redding (personal communication 2016) reports that most of the canid is most likely *Canis familiaris*, but at the time of the identification he was "very conservative about identifying dog."

onward (Arbuckle 2012). In Trench B, the less frequently recovered taxa in this Early Uruk phase level (cattle, *Equus*, and canid), are found in all zones to varying degrees. These taxa are largely represented by the dense non–meat bearing bones such as carpals, tarsals, metapodials, phalanges, teeth, or crushed skull scraps. The notable exception is a hyena (Hyaenidae family) pelvis.

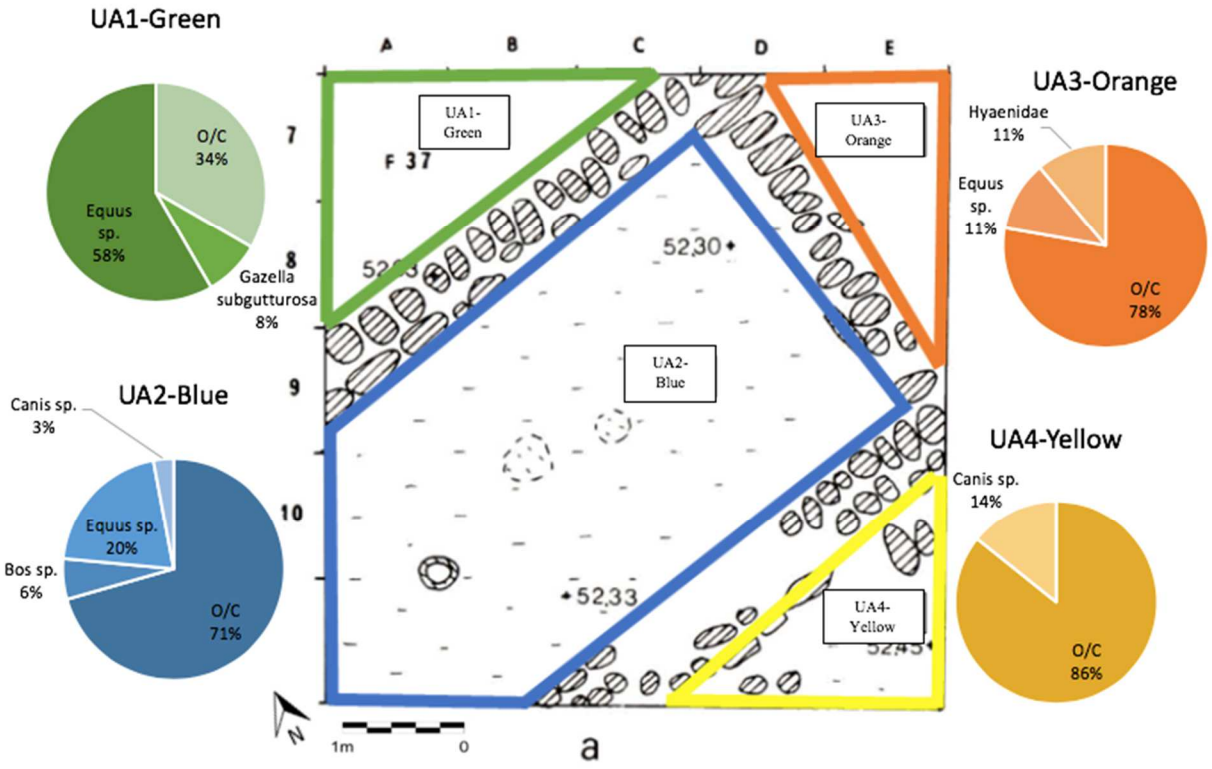


Figure 8: Early Uruk Phase Drawing Trench B, with Color Codes and Pie Charts of Taxa Present in Zones (after Wright 1981)

Of the wild animals recovered in the Early Uruk phase, the onager remains were recovered most often in the fully excavated room, zone UA2-blue. Because of the concentration of *Equus* in this zone, I calculated an MNI, and at least two individuals were found in this zone. *Equus* occurs in the zones surrounding the main exposed room, UA1-green, UA2-blue, and UA3-orange, but again, most of the bones recovered were non–meat-bearing elements. *Equus*

appears rarely at the site over all cultural phases, so the relative frequency in the Early Uruk phase is noteworthy; Redding (1981:244) noted this concentration in the original faunal report as well.

The concentration of *Equus* in UA2-blue could reflect the remains of a single event or hunt in each phase. The concentration was in the north corner, where *Equus* comprised 58% of the UA1-green taxa and 20% of the UA2-blue (main room) taxa. UA3-orange contains very little *Equus*: only one metatarsal. UA4-yellow contains no *Equus*. UA3-orange is only slightly smaller than, and similar in shape to, UA1-green; however, that it shares the *Equus* concentration suggests that the UA1-green zone had a similar access or function as the main room. The majority of taxa in the UA1-green zone are wild and *Equus* is more frequent than caprines, which are overall the most utilized taxa at the site. UA1-green contains a single gazelle bone: a metapodial. UA1-green is markedly different than the other zones in this level, despite being a corner of the step trench exposed for this phase.

For domesticates, UA1-green, UA2-blue, and UA3-orange contain caprine limb bones in some frequency; these consist mostly of hindlimb bones. UA4-yellow, adjacent to the southern edge of the main room UA2-blue, is similar in shape and size to UA3-orange and has very few identifiable bones. Of what was recovered in this zone, most were waste bones from caprines (except for a single caprine pubis fragment). The only other taxon found in zone UA4-yellow was a single lower canid tooth. Caprine meat-bearing elements (humerus, radius, femur, tibia) were most frequently recovered within the central room, UA2-blue. This central room was also the only zone of the Early Uruk level with cattle remains. Cattle were represented by small non-meat-bearing fragments: a tooth and a central and fourth tarsal.

Though it is best not to assume that prime-aged animals and meaty limb bones are universally the highest status or most desirable meat (Crabtree 1990; Hesse 1986:17–18), I argue that meaty cuts were in greater demand in a cultural system that sits in a region where social stratification had long been present (Matthews 2003). Stratification can be inferred by seals (recovered at Uruk-Warka) depicting a priest-king engaged in hunting large game (Wood 2010:32). The iconography of seals in the fourth millennium BCE throughout the Uruk world often featured wild taxa and scenes of hunting reflected the esteem and status of the hunter and of the wild animals (Englund 1995; Wood 2010: 30–36). The appearance of wild taxa and the hunt in art supports the interpretation that wild game and their cuts were desired throughout the shared culture.

The zones differ in representation of the sides of the body across taxa. In zone UA1-green, the right side was preferred for *Equus*. It is unclear whether this represents a specific allotment of cuts for meat sharing (Enloe 2003) as the elements in this zone are entirely non–meat-bearing elements from the hindlimb and therefore could be considered butchery waste. Beyond the wall, the UA2-blue main room skews toward the left for the *Equus* bones, which are also from the non-meaty hindlimbs. When looked at by level, the idea of meat allocation does not stand up as an explanation for side preferences. Most of the *Equus* appears in UA1-green in level 35, and then shifts in frequency in UA2-blue in level 36. However, when there is a left and a right of the same element (astragalus, calcaneus, and third tarsal) a right appears in the UA1-green zone and a left appears in UA2-blue zone. These left and right portions of the animal may have been attached upon arrival on one side of the wall, then subsequently dispersed.

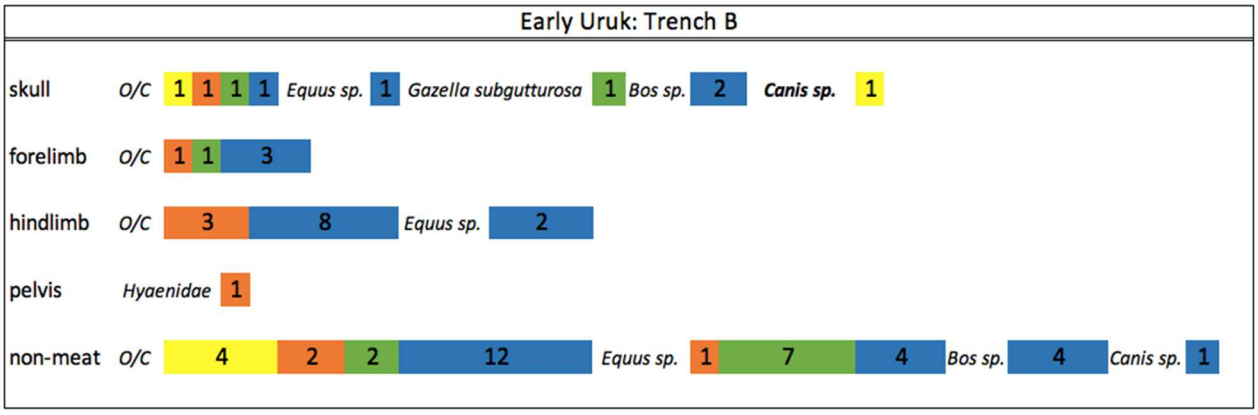
For caprines, the elements skew toward the right in both UA2-blue and UA3-orange over the wall to the east. So few caprine bones were found and could be sided in zone UA4-yellow

and UA1-green that no pattern can be seen. The *Equus* remains found in UA2-blue were all from juvenile animals; likewise, tooth wear indicates the presence of a young individual (Table 4). In the UA4-yellow zone to the south of the main room, the bone fusion analysis indicates that the caprines were also all within the juvenile-adult age range. However, this range comprises most of an animal's life, making these caprine age ranges of little use in assessing culling patterns. No aging through fusion could be determined for the bones in the UA1-green zone. The UA3-orange zone contained four bones that could be aged through fusion; they were predominantly subadult-adult bones, with one infantile-subadult bone (Table 4).

Looking at the faunal remains by the arbitrary excavation levels reveals that in level 36, the lower of the two Early Uruk levels, the main room (UA2-blue) has the largest number of animal remains. Zone UA2-blue contained the most caprines for this phase (71%). In this trench, caprines were found in all zones and all levels, but the main room had the most animal remains. Evidence for wool production appear in this phase in the form of five spindle whorls. Three came from the main room (UA2-blue): one disc whorl in level 35 (x568), one notch whorl in level 36 (x587) and another disc whorl in level 36 (x596), suggesting that textile production occurred here (Wright 1981:153-154, 384). The southern corner of the step trench, UA4-yellow, yielded two disc whorls in level 35 (x560)[9] among the scant identifiable bones.

[9] Both were given the same catalog number (Wright 1981:384).

Table 3: Early Uruk Trench B Counts of Faunal Remains by Body Part, Taxon, and Zone



Note: This table represents bones found in a body region and does not represent a full NISP of what was recovered in a zone. Skull is counted as one in all cases due to the nature of skull fragmentation.

Table 4: Early Uruk Trench B Age Range Approximations for Recovered Taxa, by Zone

Early Uruk: Trench B	
UA2-Blue	
Age Range	totals
O/C	
Juvenile-Adult	8
Subadult-Adult	2
Adult	5
Equus sp.	
Juvenile	2
UA3-Orange	
Age Range	totals
O/C	
Infantile-Subadult	1
Subadult-Adult	3
UA4- Yellow	
O/C	
Age Range	totals
Juvenile-Adult	3

Note: the totals represent the total number of elements that fit within the age range from the combined fusion, tooth wear and eruption calculations (Zeder 2006).

MIDDLE URUK SPACES

Middle Uruk: Trench A

Middle Uruk Trench A zones are divided by the walls of rooms of a small structure, and are coded as UB1-lime, UB2-brown, UB3-aqua, UB4-white, and UB5-pink.[10] Wright describes this structure as a small building with boulder retaining walls (Wright 1981:78). Where no walls were recovered; the boundary is extended on the course the wall would have taken had it continued to create the zone. UB5-pink is thought to be an alcove of a larger combined room with UB4-white[11] (Figures 12 and 13).

A shattered jar was recovered in UB4-white and is contemporary with the bins recovered in the same zone (Figure 9), feature 26 (Wright 1981:78). A notched ovoid spindle whorl (x390) was recovered in level 21 of UB3-aqua; no other artifact was specifically mentioned in this structure (Wright 1981:78). Unfortunately, most of the zones in the Middle Uruk Trench A contained very few identifiable bones. Rooms UB1-lime and UB2-brown, the rooms on the north and east of the level, contained a modest amount of caprine bones compared to the rest of the Uruk phases. UB1-lime, a large, narrow, and mostly exposed room in the north corner, contained a handful of identifiable bones: teeth and three metapodial fragments. A hearth with a beveled-rim bowl was uncovered within this room (Wright 1981:78). Beveled-rim bowls are often found in association with hearths,[12] buoying the notion that these were possible bread molds (Potts

[10] The rooms were given letters by Wright (1981). They are as follows: UB1-lime = Room B, UB2-brown = Room C, UB3-aqua = Room A, UB4-white = Room D, and UB5-pink = Room E. These letters are retained on the image, though I do not use them.

[11] Wright (1981:78) denotes this as Room DE in his description.

[12] All beveled-rim bowls were found in association with hearths or ovens at Tepe Farukhabad: within "…two shallow hearths (one covered by the floor and probably slightly earlier), a beveled rim bowl" was recovered (Wright 1981: 78); in "an elaborate oven-pit complex (Feature 17, Fig. 5k) and a nearby large pit filled with beveled-rim bowls were used" (Wright 1981:71); on a "lower floor is a hearth (Feature 24) next to which is a beveled-rim bowl" (Wright 1981:78).

2009; Porter 2012). In the adjacent zone, UB2-brown, large jar sherds were recovered in addition to the caprine bones, which include loose teeth, an ulna, and a patella. UB2-brown is a larger room, especially since it looks as though it extends into the unexcavated walls of the step trench. A pit (feature 23), from an earlier phase, encompasses almost the entirety of UB3-aqua in the west corner of the trench as well as part of UB-4-white (Figure 9). UB3-aqua contained a spindle whorl, but merely two bones can be identified to taxon: a caprine femur and an *Equus* phalanx. UB4-white parallels UB3-aqua in that the floor is the remnants of pits. The southwest side of UB4-white is feature 23 and feature 19, a later pit, occupies the south corner of the trench for this phase. The smaller pit, feature 19, cuts into a bin. The larger pit, feature 23, dates to the Ubaid period, a phase that is much earlier than the building's construction (Wright 1981:78). Most of the identifiable bones from this trench and phase comes from this room, and all of the bones found in this zone derive from layer 21 and none from the earlier layer 22. This suggests a single event; perhaps a garbage dump.

If this deposit represents a midden or a one-time meal clean-up, these bones could be deposited by those living in the later Jemdet Nasr phases (Table 2) digging into the Uruk structure floor to make this pit. Or, perhaps, the Uruk structure was built upon the earlier Ubaid phase deposits. Additionally, there was a bin within this room with "probably contemporary with one of these floors was a rectangular mud slab bin (feature 26). The relationship is not certain because the top of this bin was obscured by an intrusive pit (feature 19)" (Wright 1981:78). Therefore, the deposit is this room may not represent the people living in the Uruk.

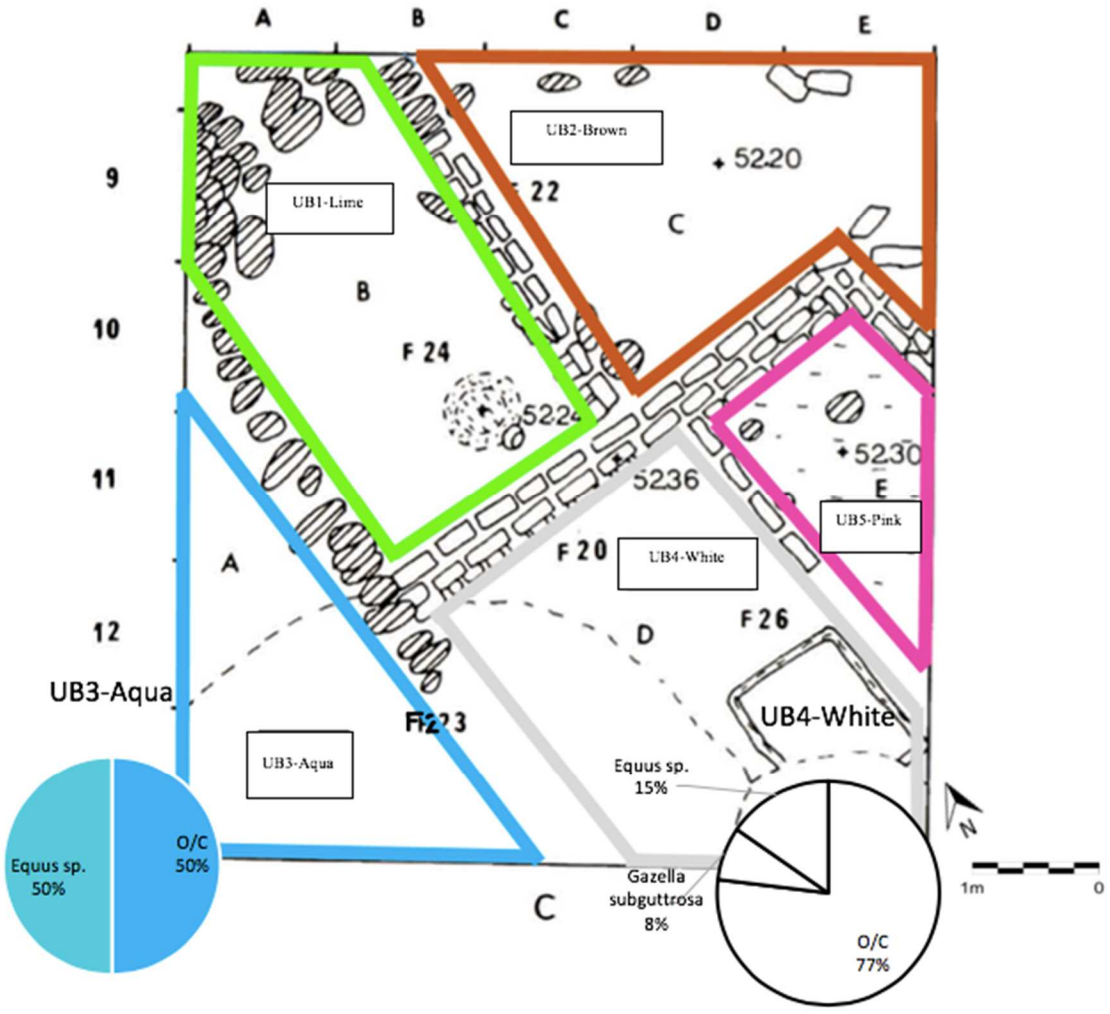


Figure 9: Middle Uruk Phase Drawing Trench A, with Color Codes and Pie Charts of Taxa Present in Zones (after Wright 1981)

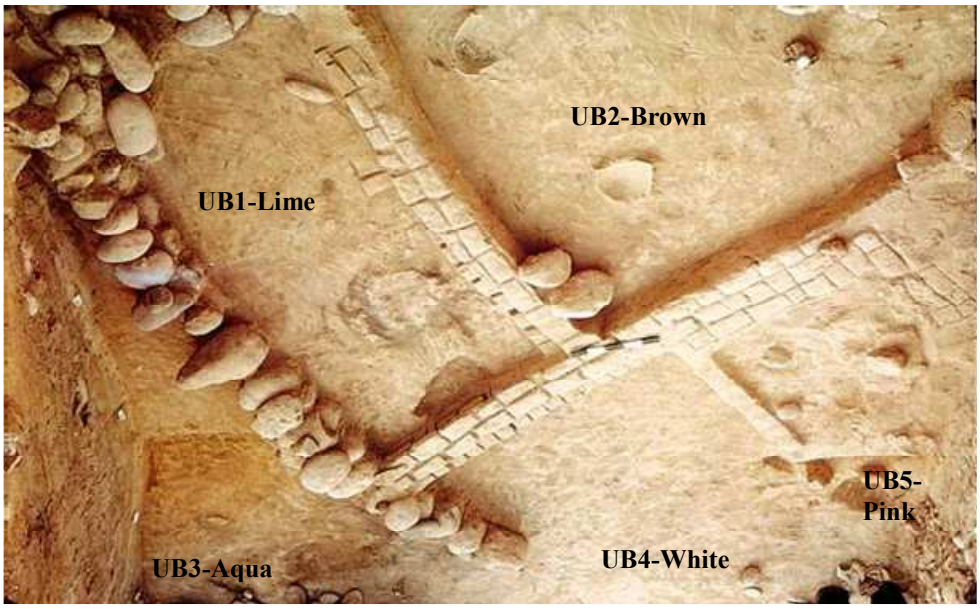


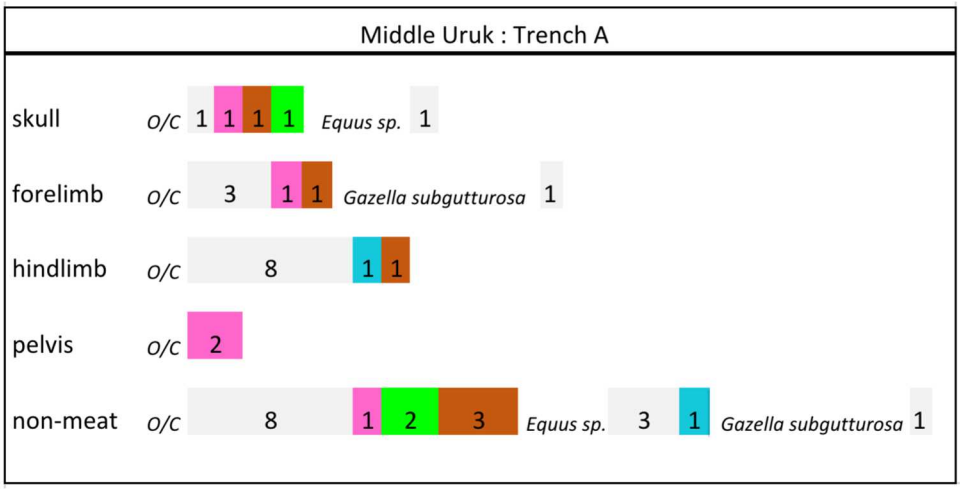
Figure 10: Photograph of Middle Uruk Trench A Zones and Walls
(photo by Henry Wright; used with permission)

UB5-pink is considered an alcove of the room UB4-white; it is small and only separated from UB4-white by a small line of brick (Figure 10). Within the UB5-pink zone, several bones were classified by Redding as being "sheep-sized" or from sheep, goat, or gazelle. I have included these in the *O/C* category, as they are most likely caprine. A single humerus, pelvis bone, an astragalus, as well as some loose teeth were found in UB5-pink.

Caprine bones were recovered in every space in the Middle Uruk Trench A zones. *Equus* is the next most frequent taxon, but once again with non-meat-bearing waste bones dominating. This trench level had a majority of hindlimbs followed in frequency by body parts likely to be butchery waste (Table 5). No siding patterns materialize in the scant findings for zones UB1-lime, UB3-aqua, and UB4-white. But for UB2-brown, all of the caprine bones that could be sided are from the left side (ulna 1L, ulna carpal 1L, second+third carpal 1L, and patella 1L). Within UB5-pink the elements that could be sided are also all from the left (humerus 1L, ilium 1L, pubis 1L, and astragalus 1L). What stands out in the patterning is that the three rooms

identified by Wright (UB1-lime, UB2-brown, and UB5- pink) contain scarcely any bones, and the bones that are present are only caprine.

Table 5: Middle Uruk Trench A Counts of Faunal Remains by Body Part, Taxon, and Zone



Note: This table represents bones found in a body region and does not represent a full NISP of what was recovered in a zone. Skull is counted as one in all cases due to the nature of skull fragmentation.

According to the epiphyseal fusion, tooth eruption, and tooth wear, all caprine age ranges appear in this level, but no clear pattern emerges from a zone. The majority of the bones that could be aged came out of UB4-white (Table 6). Several caprines can fit within the infantile range, with two positively deemed infantile— one from UB1-lime and one from UB3-aqua (Table 6). If more precise tooth wear analysis could be conducted at a future date, the age ranges would be tighter, granting greater confidence in the mortality profiles. But what can be confidently stated is that more infantile and young individuals were recovered in the Middle Uruk phases, reflecting a less uniform flock.

Table 6: Middle Uruk Trench A Age Range Approximations for Recovered Taxa, by Zone

Middle Uruk: Trench A	
UB1- Lime	
O/C	
Age Range	totals
Infantile	1
Infantile-Juvenile	1
Juvenile-Adult	1
UB2- Brown	
O/C	
Age Range	totals
Infantile-Juvenile	1
Subadult-Adult	1
UB3- Aqua	
O/C	
Age Range	totals
Infantile	1
UB4- White	
O/C	
Age Range	totals
Infantile-Juvenile	1
Infantile-Subadult	3
Juvenile-Subadult	1
Juvenile-Adult	2
Subadult-Adult	1
Adult	2

Note: The totals represent the total number of elements that fit within the age range from the combined fusion, tooth wear and eruption calculations (Zeder 2006).

Middle Uruk: Trench B

The structure in Middle Uruk Trench B is a distinct space in form and function compared to its contemporary Trench A (Wright 1981: 78). A wall divided this phase level into two zones: an open space and a cobble pathway. The wall is thicker than those in other Uruk phase buildings; the line separating the zones is arbitrarily drawn down the middle of the wall. The effect on my interpretation should be negligible, as bones do not normally come out of walls;

photographs of Tepe Farukhabad show the walls with tightly conjoined bricks, as seen in the Middle Uruk Trench A structure (Figure 10).

No non-faunal artifacts were mentioned as being recovered from this level other than six[13] spindle whorls of various types found across various levels. Most of the whorls were recovered in the UC1-purple zone, and only one notched whorl (x476) was found in the UC2-red zone. A cluster of three whorls (two-disc whorls [x462, x468 in level B32] and one plain ovoid whorl [x481 in level B33]) was found in the north through west section (in the section of the grid marked "5" and "6"; Figure 11).

In the Middle Uruk Trench B structure, the UC1-purple zone appears to be an open area with a large oval oven (F27). Wright (1981:78) calls this a room or a court. Redding (personal communication 2017) believes that ovens are usually found in courtyards, and feature 27 is a very large oven. So, both zones in this phase may be an outdoor living space measuring more than 3.6 by 3.1 meters (Wright 1981:78). The oval seen toward the north corner of the trench in UC1-purple (Figure 11) is an Elamite (Table 2) shaft that cuts into the Uruk levels. Within UC1-purple, 79% of the recovered bones were caprine, with only 9% cattle, 7% gazelle, and 5% *Equus*. Non–meat-bearing elements were the most frequently recovered among all of the taxa. Among caprines, both forelimbs and hindlimbs are represented, with slightly more hindlimbs present. The caprine meaty areas of the hindlimbs and pelvis are strongly represented in this open zone (UC1-purple), whereas bone fragments from all other taxa (gazelle, *Equus*, and cattle) constitute waste from non-meat-bearing bones. The overall caprine body part distribution is even

[13] There is a discrepancy in the tables accounting for the spindle whorls for Middle Uruk Trench B. In Wright (1981) Table 33, which tallies the spindle whorls recovered for each phase at Tepe Farukhabad, seven whorls are listed (one plain ovoid, three notched ovoids, and three-disc whorls). In Table D7 of the same publication, in the appendix listing the whorl type, catalog number, material, and weight, a total of only six whorls are listed for this phase (one plain ovoid, two notched ovoids, and three-disc whorls). It appears one-disc whorl is absent for the table in the appendix that lists the catalog numbers (Wright 1981: 154, 384).

throughout this zone, and therefore whole animals may have been butchered or eaten in this space as well.

UC2-red is a boulder pavement area adjacent to the UC1-purple zone (Wright 1981:78). In this zone, the preponderance of bone scrap is comprised of non–meat-bearing elements from all taxa (Table 7). For caprines, forelimbs, hindlimbs, and non-meat-baring bones are all present. No clear pattern of side preference appears for either zone UC1-purple or UC2-red, and the meaty elements from caprines are present, suggesting that the whole animal was present and disarticulated in these zones. With a majority of scrap from non–meat-bearing bones found in both zones, it is likely that animal processing was done throughout this level.

The fusion, tooth eruption, and tooth wear data for the whole level shows nine caprine bones aged within the range of infantile to subadult, with seven bones clearly indicating young individuals. All age ranges are present in both zones, and no patterns of age choice are apparent in the two zones. However, the bulk of caprine bones that could be aged generally fit within an older age range, with 20 categorized as juvenile to adult, 18 categorized as subadult to adult, and nine clearly falling in the adult range.

Because *Equus* teeth difficult to identify when they are unattached to the jaw and remain in wear for most their life age ranges are wide without a complete jaw; identifying eruption patterns is the most useful in this case. Among the *Equus* bones in this level, one fit in the infantile to subadult age range and three fit in the juvenile to adult range. One cattle bone was aged as an adult (Table 8).

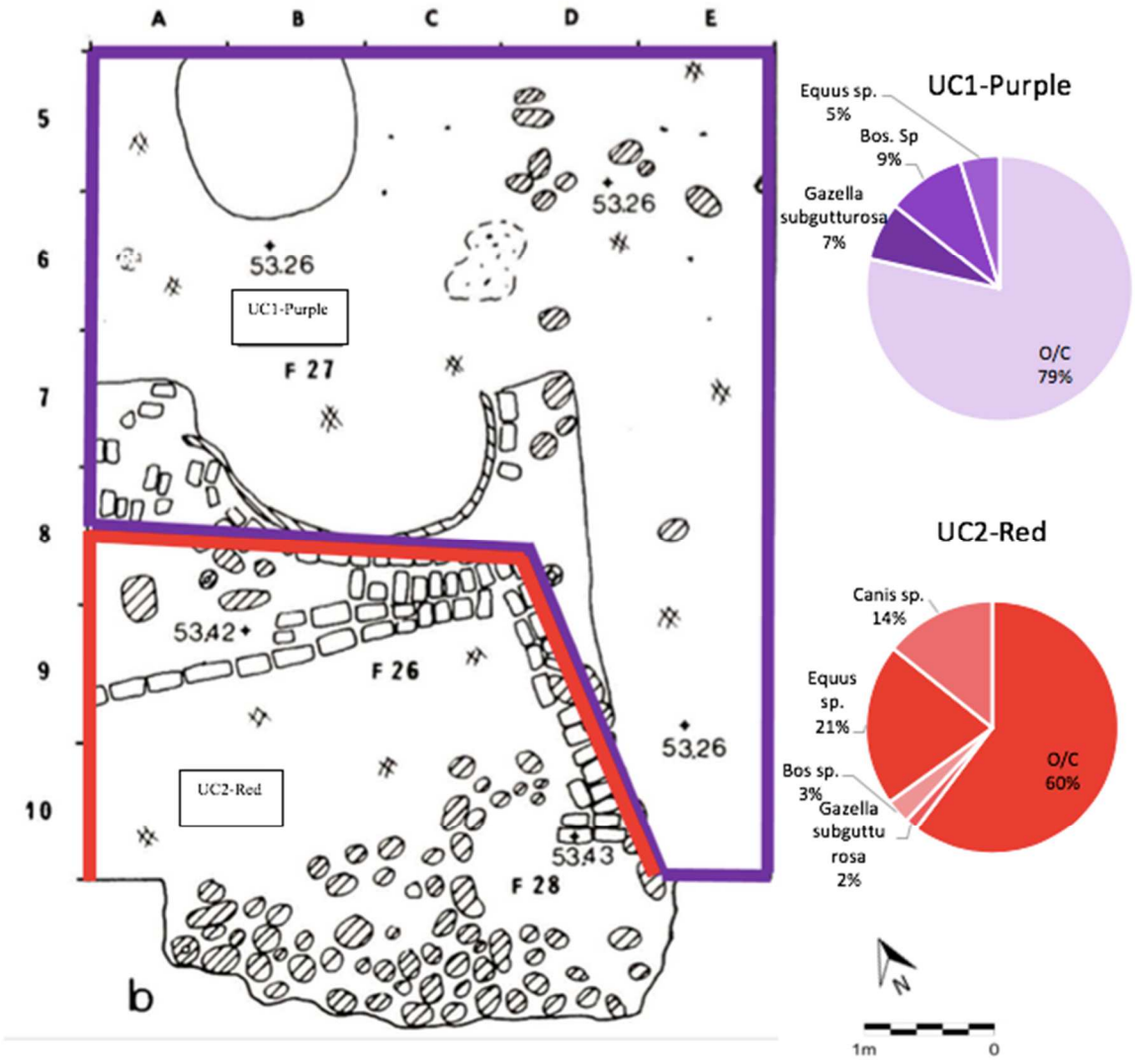


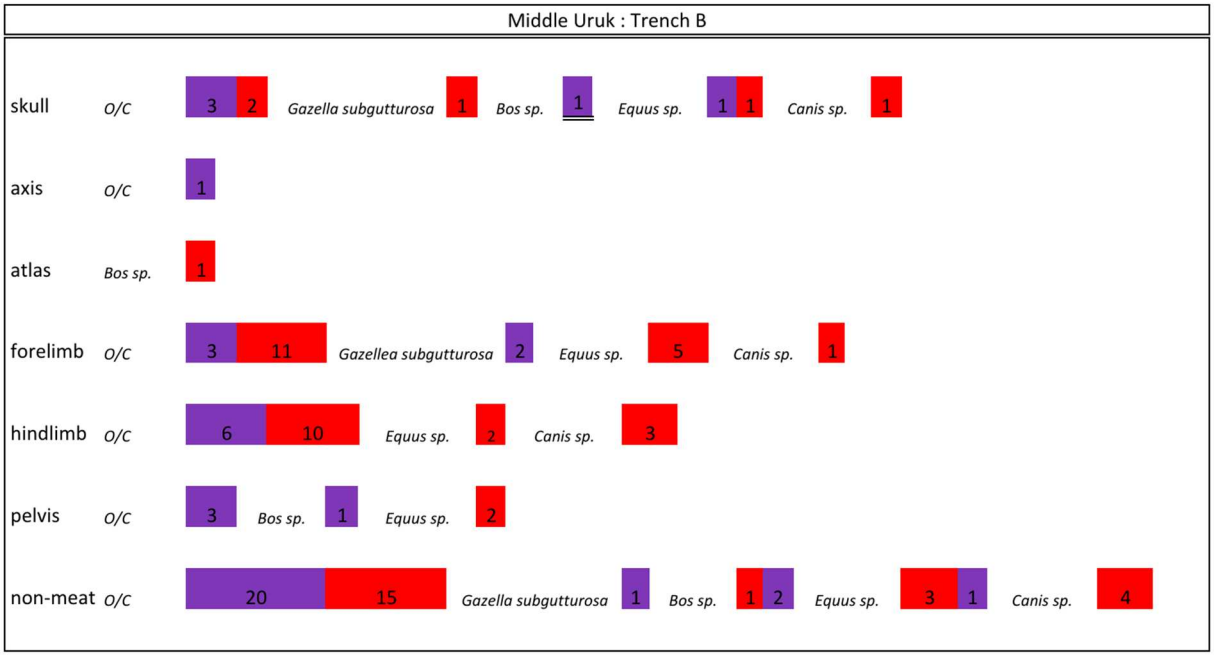
Figure 11: Middle Uruk Phase Drawing Trench B, with Color Codes and Pie Charts of Taxa Present in Zones (after Wright 1981)

The UC2-red zone, which was interpreted as a paved path, yielded a greater breadth of taxa and elements and contained more meat-bearing bones than the larger UC1-purple courtyard zone. The cobbled pathway may have been where loose bones were carelessly discarded, or it could have been less of a path and more of a paved work area where meat preparation activity took place. Additionally, several dog bones were found on this side of the wall (within the UC2-

red zone) and none in the courtyard. Two canid bones could be aged to the subadult to adult range and one to juvenile-adult (Table 8).

Even less clear is whether this space can be viewed as a domestic or some other kind of small building. A wall dividing two functionally different outdoor spaces is a possibility. The frequency of hindlimbs, forelimbs, and vertebrae, as well as non-meaty skull and foot bones in these spaces could suggest that animal processing and post-consumption discard took place in both of these zones. However, Meadow (1991:102) notes that "[p]acked bone and rubble can form a kind of natural pavement particularly if the street as a whole is used as a drain for the surrounding area." This could especially be the case for UC2-red as it appears to be a cobbled street.

Table 7: Middle Uruk Trench B Counts of Faunal Remains by Body Part, Taxon, and Zone



Note: This table represents bones found in a body region and does not represent a full NISP of what was recovered in a zone. Skull is counted as one in all cases due to the nature of skull fragmentation

Table 8: Middle Uruk Trench B Age Range Approximations for Recovered Taxa, by Zone

Middle Uruk: Trench B	
UC1- Purple	
O/C	
Age Range	totals
ca. 18 months	1
Infantile-Juvenile	3
Juvenile-Adult	9
Subadult-Adult	12
Adult	7
UC2-Red	
O/C	
Age Range	totals
Young	1
Infantile-Subadult	4
Juvenile-Adult	11
Subadult-Adult	6
Adult	2
Bos sp.	
Age Range	totals
Juvenile-Adult	1
Equus sp.	
Infantile-Subadult	1
Juvenile-Adult	3
Canis sp.	
Juvenile-Adult	1
Subadult-Adult	2

Note: the totals represent the total number of elements that fit within the age range from the combined fusion, tooth wear and eruption calculations (Zeder 2006)

LATE URUK SPACES

Late Uruk: Trench A

A brick wall divided Late Uruk Trench A into two zones as well: a larger zone and a narrow zone along the south and west corners of the trench. This phase level contains a small structure that was poorly preserved. The open space, which occupied much of the trench, was coded UD1-gray (Figure 12). The area below the boundary wall was coded UD2-violet and

makes up the small structure with two mud slab bins in an alcove. The bins contained charred barley and wheat residue. The brick footing consists of various reconstructions from being rebuilt several times, and the rooms have eroded away (Wright 1981:78).

In the UD1-gray zone, several eroded bricks and cobbles from a small structure fill the zone; no other artifacts were noted. The fauna within this zone are mostly trash bones from the skull and feet (Table 9). Of the caprine remains, limb bones were concentrated in the larger UD-1-gray zone, while the UD2-violet zone contained vertebrae, which may have had meat filleted off, and an ischium. Of the two zones, the UD1-gray zone had remains that held more meat.

Caprine remains appear in both zones to a similar degree, representing 80% of the bones in UD1-gray and 87% of the bones in UD2-violet. However, UD1-gray, the larger of the two zones, contains more bones overall. The smaller zone and structure, UD2-violet, consists of densely scattered stone and brick along with the bins but had nearly the same ratio of caprine bones (relative to other taxa) as the much larger UD1-gray zone.

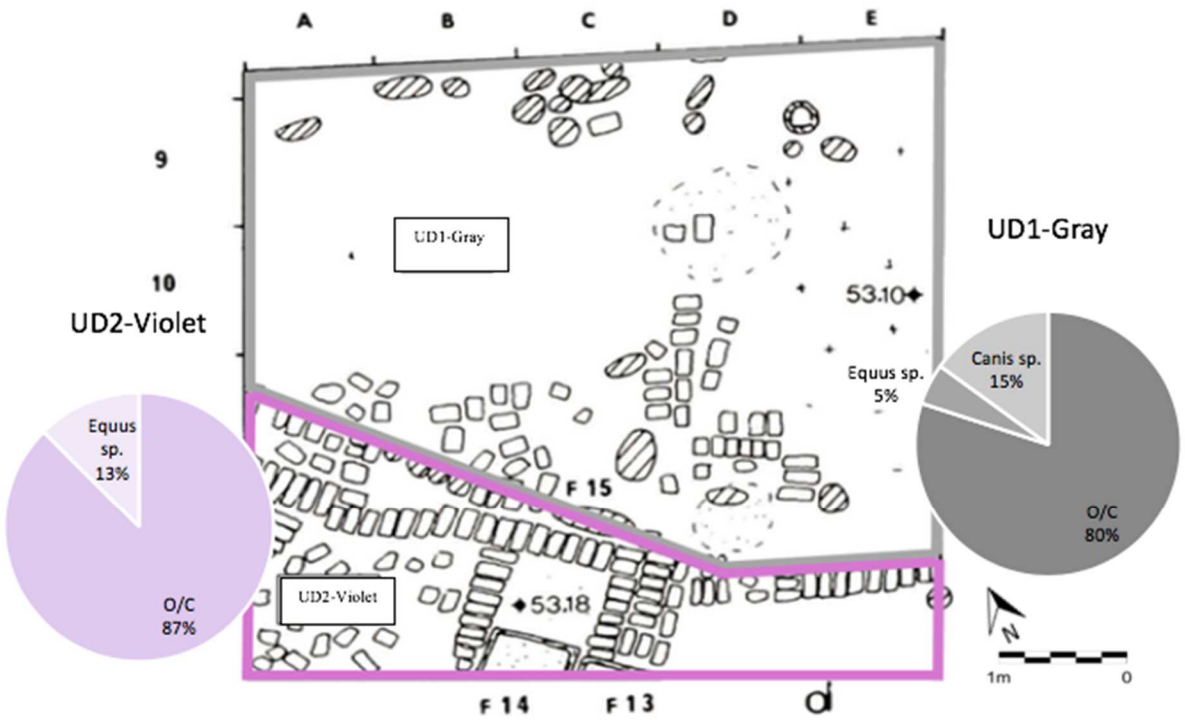
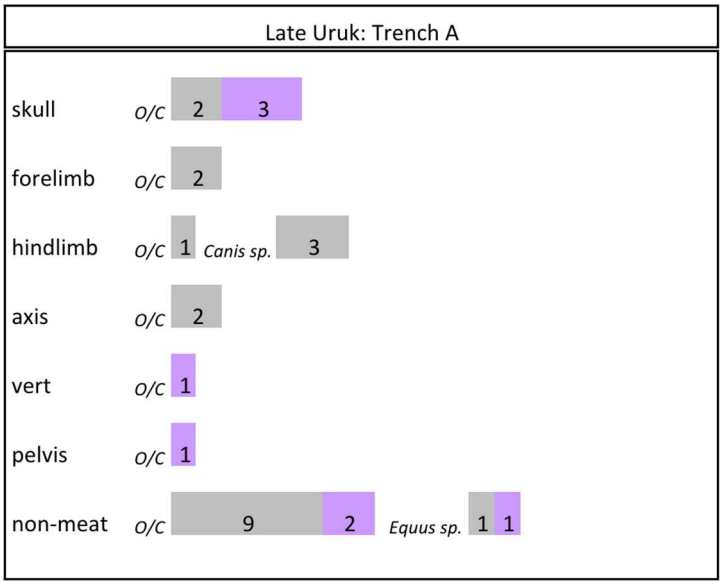


Figure 12: Late Uruk Phase Drawing Trench A, with Color Codes and Pie Charts of Taxa Present in Zones (after Wright 1981)

An *Equus* phalanx appeared in each zone, and these two bones represent the entirety of this taxon for the whole trench in this level. The small structure in UD1-gray revealed a small concentration of three canid femurs, which were all sided as lefts. Two individuals can be accounted for when calculating for MNI. In addition, the canid bones were aged to adult (Table 10).

The fusion, tooth eruption, and tooth wear data reveal the presence of caprines from very young to adult; no clear pattern emerges. Only the UD1-gray zone contained bones that could be aged. Of the ageable bones, two caprines fit within the infantile to juvenile range, six in the juvenile to adult range, and two clearly fit in the adult range (Table 10).

Table 9: Late Uruk Trench A Counts of Faunal Remains by Body Part, Taxon, and Zone



Note: This table represents bones found in a body region and does not represent a full NISP of what was recovered in a zone. Skull is counted as one in all cases due to the nature of skull fragmentation.

Table 10: Late Uruk Trench A Age Range Approximations for Recovered Taxa, by Zone

Late Uruk: Trench A	
UD1-Gray	
O/C	
Age Range	totals
Infantile-Juvenile	2
Juvenile-Adult	6
Adult	2
Canis sp.	
Age Range	totals
Adult	2

Note: the totals represent the total number of elements that fit within the age range from the combined fusion, tooth wear and eruption calculations (Zeder 2006).

Late Uruk: Trench B

In Late Uruk Trench B, we find the first building described as a major structure built after the Farukh phase. Three zones divide this trench phase, with walls separating the zones (Figure 13). Because no corners were exposed, it is ambiguous whether these zones were inside or outside spaces, or whether this building had a roof. The rooms of this structure are estimated to span more than 4.6 by 1.9 meters (Wright 1981:81). Two segments of a wall made of small bricks runs northeast to southwest through the trench, and a possible buttress lies to the east.

Zone UE1-forest encompasses the north corner and is separated by a thick wall segment running north to south and a thin brick wall segment running east to west into a pit (Figure 13). The pit was an Elamite shaft and straddles the divide between zone UE1-forest and UE3-gold (Wright 1981:81); this is illustrated by an oval in the drawing.

The largest zone lies beyond the thick wall and was coded as UE2-magenta. A probable oven sits in this large open zone and is evidence that this zone may have been an open-air courtyard. South of UE1-forest lies zone UD3-gold, which occupies the west corner of the trench. A ceramic drain runs through the UE3-gold zone.

Most of the identifiable fauna emerges from UE2-magenta, the largest zone and a likely courtyard, with 122 bones identified to taxon (Table 11)**.** This was the highest number of bones for any zone examined. Caprine forelimb bones were slightly more prevalent in this zone compared to hindlimbs, with one scapula, six humeri, four radii, and two ulnae. Hindlimb bones make a fair showing (two femurs, three tibia), with several bone fragments coming from the pelvis (three ilia, two ischia, and three pubis). Lefts dominate the caprine bones for this zone. *Equus* follows as the second most frequent taxon, with only one limb bone, a tooth, and a sesamoid.

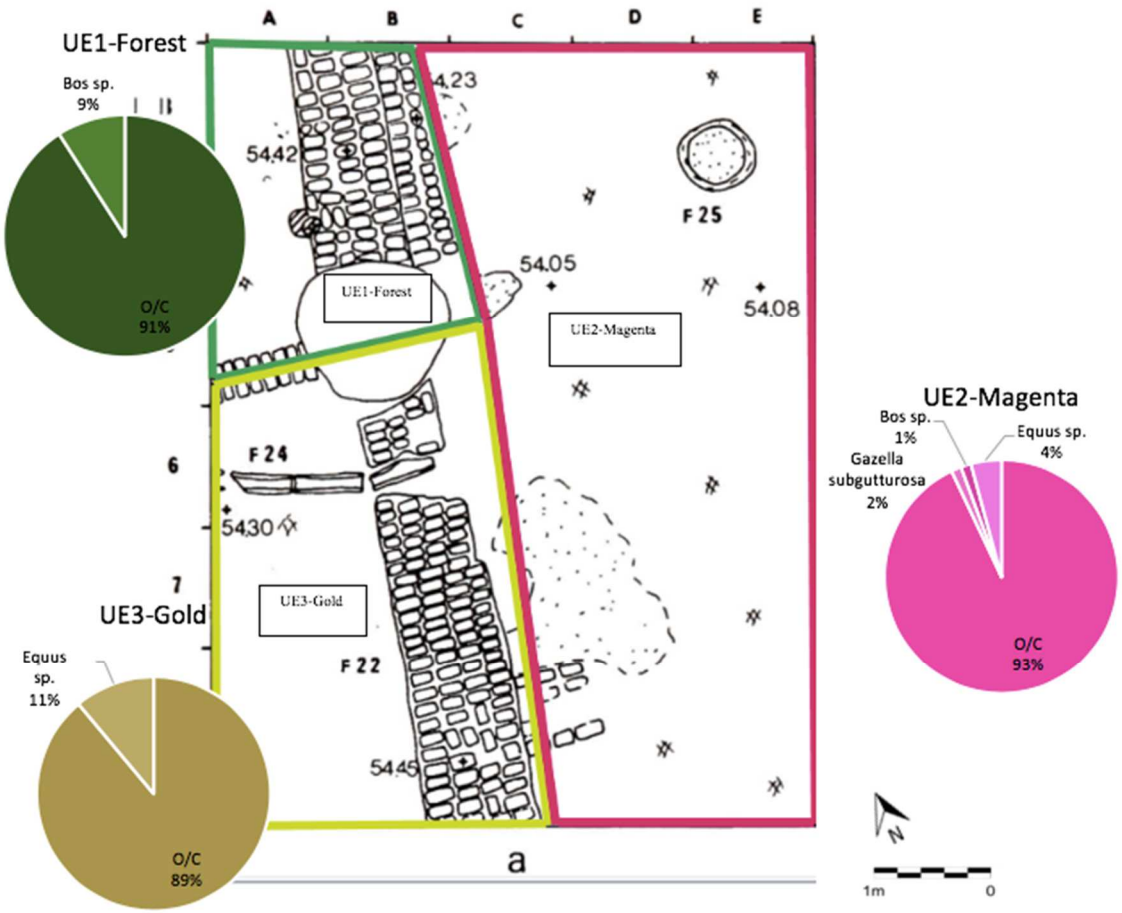


Figure 13: Late Uruk Phase Drawing Trench B, with Color Codes and Pie Charts of Taxa Present in Zones (after Wright 1981)

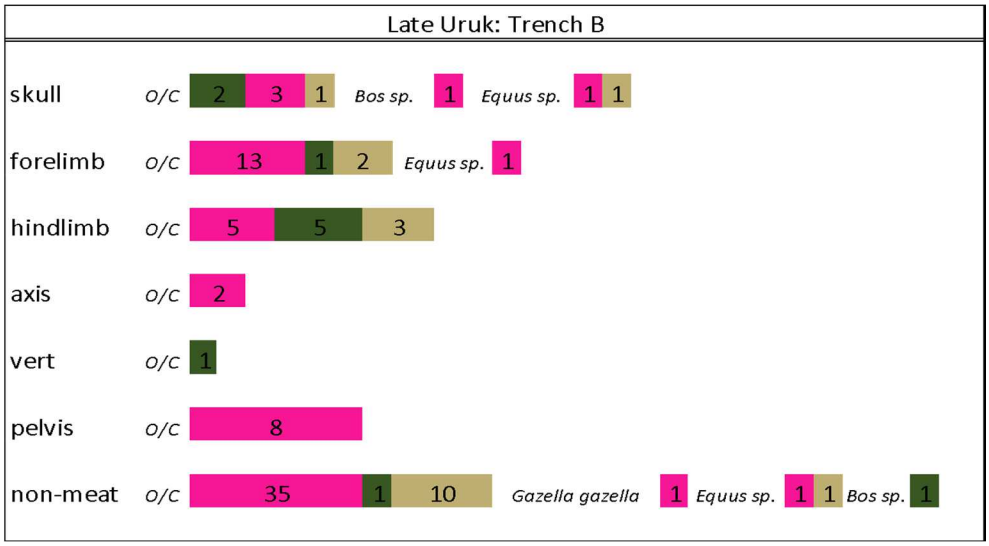
UE1-forest, the smallest zone outlined, contains an amount of caprine bones on par with much larger zones from earlier phases or from Trench A. Thirteen bones were found in total for this zone and it favors hindlimbs with three femurs, one tibia, and one humerus. Only caprines and a single cattle bone come out of this zone. Bones from the left side dominate the forelimb in this zone.

UE3-gold is a larger zone, but the lower segment of the thick wall takes up a good portion of it. Thirty-four bones appeared in total—thirty of which were caprine with an even

body part distribution. The caprine bones that could be sided also skew left. *Equus* is the only other taxon in this zone and is represented by a tooth fragment and a metapodial.

Most of the fusion, tooth eruption, and tooth wear data comes out of zone UE2-magenta (Table 12). Within UE2-magenta, twenty-one caprine bones fall between juvenile and adult, with one of these being a possible senile. In the other two zones, the caprine age ranges are similar, but the counts are fewer. Within UE2-magenta, eight infantile to juvenile caprine bones are found within this zone. Additionally, a single *Equus* humerus could be aged and fits within the juvenile to adult range, while a worn cattle tooth was aged to the infantile to juvenile age range. Within UE1-forest, one caprine was aged to the infantile to juvenile range and three were aged to the juvenile to adult range. Within UE3-gold, eight caprines fit within the juvenile to adult range and one was aged as an adult (Table 12).

Table 11: Late Uruk Trench B Counts of Faunal Remains by Body Part, Taxon, and Zone



Note: This table represents bones found in a body region and does not represent a full NISP of what was recovered in a zone. Skull is counted as one in all cases due to the nature of skull fragmentation

Table 12: Late Uruk Trench B Uruk Trench B Age Range Approximations for Recovered Taxa, by Zone

Late Uruk: Trench B	
UE1- Forest	
O/C	
Age Range	totals
Infantile-Juvenile	1
Juvenile-Adult	3
UE2- Magenta	
O/C	
Age Range	totals
Infantile-Juvenile	8
Juvenile-Adult	12
Subadult-Adult	7
Adult	1
Adult-Senile	1
Equus sp.	
Age Range	totals
Juvenile-Adult	1
Bos sp.	
Age Range	totals
Infantile-Juvenile	1
UE3- Gold	
O/C	
Age Range	totals
Juvenile-Adult	4
Subadult-Adult	4
Adult	1

Note: the totals represent the total number of elements that fit within the age range from the combined fusion, tooth wear and eruption calculations (Zeder 2006).

SUMMARY

Understanding Tepe Farukhabad's households proved to be challenging without the benefit of having the architectural spaces fully exposed. However, we do see subtle differences between the zones, with none more clearly apparent than in the Early Uruk Trench B structure. The rooms of this potential household reveal strong concentrations of taxa, siding, and elements.

A single hunting event may have taken place in this earlier phase, yielding the concentration of *Equus* in the main room (UA2-blue) and the north corner zone (UA1-green). The faunal patterning is clear in this phase even if the relationship between the patterning and architecture is not. It is notable that the zones with the most faunal activity also have the highest concentrations of spindle whorls. A fine grain look at the fauna in this instance illuminated small instances of siding patterning, but overall remained difficult to parse out.

In the Middle Uruk Trench A structure there is a stark difference between how few remains were recovered in most of the zones (UB1-lime, UB2-brown, and UB5-pink) compared to the remains from the single building from the Early Uruk. Most of the faunal activity in the Middle Uruk Trench A was from a room with a bin and pit (UB4-white) yet this also comes from the zone with the least depositional integrity as most of the bones come from rooms with pits. In the Middle Uruk Trench B, more diversity in elements emerges, with perhaps the strongest evidence of processing activity.

Wild taxa wanes in the Middle Uruk as caprines clearly become the main economic focus. After the Early Uruk, almost every phase contained *Equus* but in much smaller amounts. However, with only one trench from the Early Uruk exposed it is difficult to know whether this hunting was more prevalent overall during that phase.

In the Middle Uruk, the herd population is varied, with young and older caprines present throughout (Tables 6 and 8). The herds do not reflect a highly forced age profile, but rather, all age groups were being maintained at Tepe Farukhabad in this phase. In the Middle Uruk, each zone was dominated by caprines, but at a lower concentration.

The areas I postulate to be courtyards or common spaces across the Middle Uruk and Late Uruk phases held the most diversity in taxa and more often contained wild taxa and canid

(UB4-white, UC2-red, and UE2-magenta)**.** Hunting supplemented the diet throughout the Middle and Late Uruk, but was not emphasized in the Late Uruk, as evidenced by the preponderance of caprine bones in each of the Late Uruk zones. Canid remains, where present, are concentrated on one side of a wall.

Each phase and trench had a zone that clearly contained more meat-bearing long bones than others. In the Early Uruk Trench B this was the UA2-blue zone, in the Middle Uruk Trench A it was the UB4-white zone, in the Middle Uruk Trench B it was the UC2-red zone, in the Late Uruk Trench A it was the UD1-gray zone, and in Late Uruk Trench B it was the UE2-magenta zone (Tables 3, 5, 7, 9, and 11). The higher frequency of limb bones could point to the status of community members occupying or using those spaces (Crabtree 1990), or in the case of open-air courtyards where they were discarded as waste. The relative lack of meat-bearing bones in adjacent zones may indicate the dispersal of waste from butchery and processing. By the Late Uruk, the left side of the body was recorded most often; it is unclear what this indicates. It may reflect a meat distribution that extended beyond the household.

This fine-grained look at faunal remains in households and community spaces suggests a local and independent provisioning strategy rather than flocks maintained for a meat consuming export. Wattenmaker and Stein (1986:94) conclude that at Kurban Hüyük "the presence of animals in all age categories suggests that [a] village site consumed its own livestock, rather than supplying any larger sites with prime-age sheep and goats." Using Wapnish and Hesse's (1988) model, I argue that the presence of young and old individuals at Tepe Farukhabad indicates a self-contained animal husbandry strategy that is not aimed at meat export (Wapnish and Hesse 1988; Wattenmaker and Stein 1986).

It is not likely that Tepe Farukhabad had a producing economy, as defined by Wapnish and Hesse. No clear faunal patterning emerges in the zones that would indicate a closely controlled administrative enterprise or producing economy with a well-organized administrative role. They argue that a producing economy profile would contain the remains of the very young and the very old, as these would reflect local consumption from the culled breeding stock while the prime-aged individuals would be mostly reserved for export (Crabtree 1990:162; Wapnish and Hesse 1988:84). No neonatal, accidental, or disease-related deaths were noted in Redding's (1981) report, and only one senile is recorded in the Late Uruk. Of course, this does not mean the very old or the infirmed never lived at Tepe Farukhabad, but it perhaps suggests that most animals were culled in the juvenile to adult age range. Mostly importantly animals from every age range were present at Tepe Farukhabad suggesting a herd that may not have been carefully culled for an intensely controlled purpose.

An even distribution of body parts, including skull fragments, vertebrae, and foot bones, throughout all of the Uruk phases also suggests a self-contained production and consumption site. Wild taxa continued throughout all of the Uruk phases as well. Even with a decline in the appearance of wild taxa in the Late Uruk, *Equus* and gazelle were still recovered from both Trenches, indicating that hunting supplemented the diets of villagers even with the shift in focus towards domesticates.

Zeder (1991, 1994) established a model for what a specialized state economy might look like and how the production and distribution of pastoral resources might fit into it. This model focused on meat procurement and can apply to initial urbanism despite her original investigation being of a third millennium BCE urban center[14] (Melinda Zeder, personal communication 2018).

[14] Zeder (1991) tested this model on the Ur III site Tel-y Malyan, which dates to the third millennium BCE.

She predicted that a specialized animal economy could be identified in a faunal assemblage and would be one with an indirect access to meat. Her model was on the receiving end of a producing economy and would appear in a faunal assemblage as having less diversity in species, sex, and age. Tepe Farukhabad would, as a purposed producer, have exported this profile to an urban center. At Tepe Farukhabad, a standardized cull pattern is not clear, and there was no obvious evidence for an effort to move animal products transregionally aside from seals—which now seems dubious in light of the clay analysis (Blackman 1985, 1999; Pittman and Blackman 2016:877). Rather, villagers obtained meat for their own purposes and there is little evidence of state-controlled flocks or standardized butchery (Zeder 1991).

Lastly, Tepe Farukhabad does not meet the mark for a consuming economy that would have received imports of animal products when measured by Wapnish and Hesse's standard. Even with the incomplete aging data, the presence of young and adult animals is clear throughout, and especially in the Middle and Late Uruk phases (Tables 4, 6, 8, 10, 12). A consuming economy would contain caprines at peak weight between 1.5 and 2.5 years of age and with only few older individuals retained for reproduction (Crabtree 1990:162; Wapnish and Hesse 1988:84). At Tepe Farukhabad, each Uruk phase contains at least two caprines (often more) that are clearly adult. Using Zeder's (2006), model, this means that these individuals were older than four years of age (Appendix Tables 29-31). Most specimens fall within the juvenile to adult range, meaning that probably additional caprines would be older than four years of age and past the "market age." However, this could also, because it is a range, mean that they are all juveniles as well. More refined aging analysis using Grant (1982) or Payne (1973) would clarify the caprine age profiles at Tepe Farukhabad.

Overall, the economic strategy at Tepe Farukhabad was oriented toward self-sufficiency in meat production. Wattenmaker and Stein (1986:90) found that simple societies that depended on local consumption raised herds for a combination of meat and milk, with limited exchange within or between sites. These societies likely traded among themselves as well as with those passing through using the administrative technologies that were common in the region.

CHAPTER 4: TEPE FARUKHABAD'S PLACE IN THE URUK WORLD

TEPE FARUKHABAD: AN ADMINISTRATIVE CENTER?

The Uruk period marks the beginning of proto-literacy with three-dimensional accounting tools and, later, tablets. These tools were created to manage the movement of goods, including livestock, through space (Porter 2012:148; 151–153; Schmandt-Besserat 1978). This made face-to-face transactions no longer necessary in every instance of exchange (Porter 2012). Although these geometric administrative technologies had been in use across the Near East since the Neolithic (ca. 3400/3300 BCE), they came into common use during the mid to late fourth millennium BCE (Blackman 1985; Porter 2012:147; Wengrow 2010:61). These devices provided people with what David Wengrow has called a "shared language of signification" (Wengrow 2010:61).

Others argue that these devices developed in large part to facilitate long-distance trade (Nissen et al. 1993, Trigger 2006; Wright and Johnson 1975; cf. Porter 2012:150–152). Many believe that "writing developed as a direct consequence of the compelling demands of an expanding economy" (Nissen et al. 1993:116). Porter critiques this prevailing view of the origins of writing. She questions the economic basis of writing's evolution and whether its development was essential for state formation (Porter 2012:147). Porter interprets item lists, which emerge in

early examples of writings, not as commodities or counters like those used for a storehouse inventory, but as a "cosmological order of things." Porter (2012:150) writes:

> That there is a perceived relationship between things which serve to constitute a proper cosmological order, a relationship that precedes writing, is evident right at the outset when the relationship is first materialized in tokens, when the shape of the token denoted both item and quantity.

Administration and exchange are not the emphasis in her interpretation. Wright and his cohort fall under the banner of scholars who argue for an economic explanation for administrative tools. Tepe Farukhabad has always been framed as a small administrative center active in facilitating long-distance exchange (Moghaddam 2012; Wright 1981, 1994, 2013, 2016; Wright and Johnson 1975).

Critical to this perspective is the evidence for presumed accounting devices at the site that are thought to have been used to regulate of economic transactions. So, whether or not writing was created to order the world as Porter argues, three-dimensional accounting tools, and later, tablets were created to manage the movement of goods, including livestock, though space (Porter 2012:148; 151-153; Schmandt-Besserat 1978). This made face-to-face transactions no longer necessary in every instance of exchange (Porter 2012).

The administrative devices from Tepe Farukhabad consist of a bulla with three seal impressions[15] (x556) (Figure 14B), seal impressions on a clay bale (x299, 60203) and bitumen (x081, 60101), a bone seal (x567, 60798), and a clay stamp seal (x698) (Wright 1981:156–157). Seal designs belonged to an individual official who processed goods (Van de Mieroop 2007).

[15] One impression is thought to represent a scorpion without the pincers or tail, another is described as two animals back-to-back, and the third is thought to be a braided design or a guilloche–possibly snakes, animal tails, or necks (Wright 1981:156).

According to Wright, this assemblage attests that Tepe Farukhabad was a participant in economic transactions and accounting procedures that are typically associated with the beginnings of complexity. Wright (1981:278) outlines Tepe Farukhabad's perceived role in inter-regional exchange and, ultimately, state formation when he writes:

> Thus, the transformation of inter-regional exchange seems to follow that transformation in control organization termed the origin of the state. If the Farukhabad data provide a correct assessment of exchange, then one cannot argue that increasing production for export is an explanation of initial state emergence in Greater Mesopotamia.

Wright and Johnson (1975) contend that Tepe Farukhabad and other sites "produced direct evidence of administrators" facilitating exchange (Wright 1981). Wright interpreted the bulla found at Tepe Farukhabad as a shipment received by administrators (Wright 1981:156). He believes the significance of the bulla[16] is that a large shipment of goods was sent to Tepe Farukhabad as an outpost and an "authority of at least three seal-bearers, two using ordinary stamp seals and one using a more unusual seal" processed these goods on behalf of an outside entity (Wright 1981:156). "The presence of a possible weight also suggests that the transfer of some type of commodity was carefully checked. However, none of these activities necessitate figures of high rank, nor does their presence indicate more than one level of decision-making hierarchy at Farukhabad itself" (Wright 1981:186). Yet in his interpretation there is an assumption that a representative from a regional authority was present and involved in processing the shipment associated with the bulla and weights. However, there is no overt reason

[16]In response to clarification on if the bulla was an envelope or solid, like unto a token, Wright replied with, "The bulla is hollow. The inner cavity was about 2 cm in diameter and one can make out the imprint of at least one counter on the interior, as noted on page 156 of the monograph. Alas, the image on Plate 16 does not show the hollow interior" (Wright, personal communication 2019).

to assume that this interaction is with individuals abroad or outside the community aside from the presence of the bulla itself.

Recent chemical analysis of clay seals using instrumental neutron activation analysis (INAA) by Holly Pittman and M. James Blackman (2016) at Tell Brak, and previous studies by Blackman (1985, 1999)—which include clay comparisons from Tepe Farukhabad, as well as from Sakheri Sugheri Sughi, the Deh Luran Plain, and Khuzistan—call into question the large-scale administration of trade. Blackman tested one sealing and eleven clay objects from Tepe Farukhabad and compared them to clays from Hacinebi (James Blackman, personal communication 2018). Blackman tested clays from Tepe Sharafabad, Susa, Tepe Yahya, Tepe Gawara, Tell Brak, Tel-i Malyan, Arslantepe, and Hacinebi as well (Blackman 1985). He assessed clay composition and created a local chemical fingerprint for each region; the objects tested were determined to be by-and-large made of local clays (Pittman and Blackman 2016; James Blackman, personal communication 2018). The chemical analysis of seals and sealings showed little evidence for seal movement over long or medium distances in the vast majority of the sites tested (Blackman 1985, 1999; Pittman and Blackman 2016:877).

Although a "small but significant" corpus of non-local clay seals was included among samples from Hacinebi and Tel-e Malyan (Zeder and Blackman 2003), Pittman and Blackman ultimately conclude "that the movements of goods from outside of the sites was minimal and was an insignificant component of the administrative activity undertaken at any of these sites" (Pittman and Blackman 2016:883). These non-local clays are argued to be from colonizers moving from Susa to Hacinebi and not from long-distance administrative transactions (Pittman and Blackman 2016); the clays of Susiana origin "mark the originary moment of the arrival of the immigrants from the south" (Pittman and Blackman 2016:879). Pittman and Blackman found

that “the uniformity of imagery and administrative function over such a large geographic region cannot be understood as solely the result of the movement of goods” (Pittman and Blackman 2016:877). Rather, they believe that the uniformity is due to the craftspeople traveling between cities as well as “stylistic emulation” (Pittman and Blackman 2016:882).

If the clays administrative tools did not come from inter-regional trade, but rather were made and used locally, it would seem that, contrary to Wright’s original interpretation, administrative technology from Tepe Farukhabad was not necessarily used in connection with long-distance trade. The seals at the “small and isolated outpost at Tepe Farukhabad” (Wright 1981:188) could have been used by locals for local purposes. However, Schmandt-Besserat (1982a), the scholar who discovered the function of tokens and bullae, does not believe administrative technology was used for face-to-face transactions. She writes: “Such transactions, however, as in local trade, would be carried out in face-to-face meetings and would…not require recording. We may expect, in other words, that the transactions that led to recordings were not face-to-face but probably involved intermediaries” (Schmandt-Besserat 1982a:874). In light of the finding that clays used in administrative technologies were mainly local in origin, Wright has since amended his view on Uruk administrative practices. He suggests that roving administrators moved throughout the region rather than clay seals (Wright 2016). But could it be that these tokens were more analogous to the paper receipts that are used presently for face-to-face transactions?

To suggest this is not to refute participation in common economic practices and systems of signification throughout the region. There must have been long-distance trade, but possibly not as rigidly controlled by a state as was imagined. There certainly was an exchange of culture if not clays. For example, the iconography of the bone stamp from Tepe Farukhabad belongs to

what Pittman has identified as the "baggy" style (Pittman 2013:299) from the Susiana Plain. Once again, Susa may have been the major source of cultural influence and not Uruk-Warka to the south.

An additional artifact should be included in the context of administration and commodity exchange. Wright classified a clay ovoid (x338,60833) as a "sling missile" used either as a weapon in cases of "minor raiding" or for fishing or hunting of small birds and mammals (Figure 14A) (Wright 1981:157, 163). He based this identification on a weight similar to Hellenistic sling missiles described by Korfmann (1973).[17] However the so-called "sling missile" from Tepe Farukhabad is more likely a plain token, of the type VI delineated by Denise Schmandt-Besserat (1978).

Schmandt-Besserat (1982b) identifies four major steps in the evolution of writing: (1) a system of recording based on tokens and counters starting in 8000 BCE; (2) clay envelopes or bullae emerge in 3300 BCE; (3) signs and impressions appear on the surface of the envelopes circa 3300 BCE; (4) clay cuneiform tablets with incised signs appear and replace the token and envelopes in 3100 BCE (Schmandt-Besserat 1982b:3). All but step four appear at Tepe Farukhabad.

She argued that tokens represented a set quantity of a particular good (Schmandt-Besserat 1980:370-375; 1982:872). In her extensive review of site assemblages, she found that tokens were often misidentified as marbles or sling missiles (Schmandt-Besserat 1978: 54). I believe this is the case with the "sling missile" listed at Tepe Farukhabad: rather it is a token.

[17] It is likely that this identification of the ovoid came from comparison with Tepe Ali Kosh, where Hole et al. identified similar artifacts as "sling missiles." However, those authors admit the classification of "sling missile" is for "convenience only" and question what their true function may have been (Hole et al. 1969: 213, 365).

It is clear that an accounting system was in use on the Deh Luran Plain with the presence of seals, bulla, and what I identify as a token— as was common throughout the region at this time. Whether the exchange was from within or without, a recording and accounting method was used. I am arguing that from the presence of these materials alone, it does not follow that Tepe Farukhabad was an important outpost in a vast trade network; merely that it was incorporated into the wider shared culture.

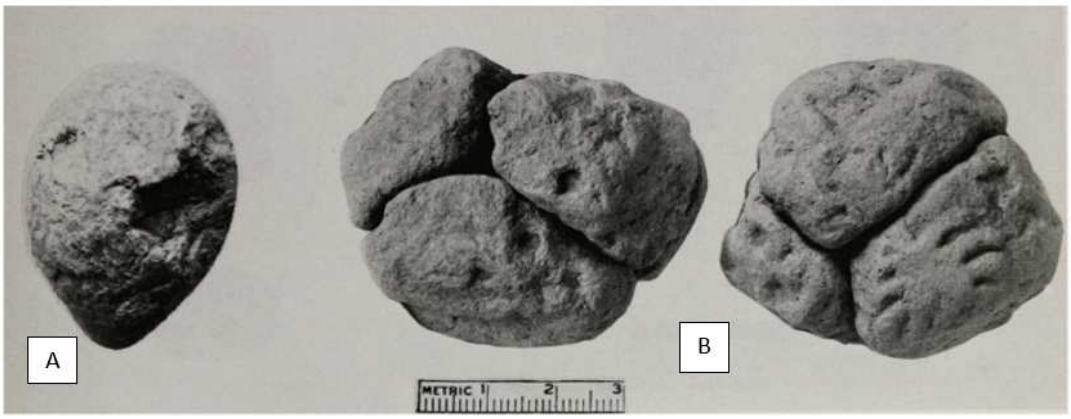


Figure 14: Misidentified Token (A) and Bulla (B, front and back) from Tepe Farukhabad (after Wright 1981; used with permission)

CHAPTER 5: EXPORT ITEMS: AN UPDATED REVIEW

DISCUSSION

Archaeologists who led the initial framing of the Uruk expansion made assumptions regarding the direction of power and influence and the nature of exchange networks. The limited presence of administrative technology at Tepe Farukhabad ostensibly positioned the site within a vast regional trade network. A relatively small assemblage of sealings and a bulla designated Tepe Farukhabad as an administrative center with a robust export industry.

As for the items processed by administrators, Wright (1981: 266-271) put forth that chert cores, bitumen, labor, animals, and their products were exported from Tepe Farukhabad, making

it a major player in the Urukian administrative network. The Deh Luran sits close to central Sumer and is a possible source of stone, wood[18], and bitumen. Therefore, Tepe Farukhabad was proposed as a source of materials for the growing urban centers (Wright 1981:64). Though the community was small, he assumed that the people of the Deh Luran Plain were "sufficiently visible" to larger foreign polities, and they would have sought an alliance. He maintains that those living on the tell could obtain outside items and would know the current relative rates and values for exchange (Wright 1981:265).

TRADE AT TEPE FARUKHABAD REEXAMINED

Medium gray chert cores were singled out as the most likely chert type to be traded from Tepe Farukhabad, though fine dark brown chert, fine red chert, and green chert were also identified (Wright 1981:265–266). Tepe Farukhabad is thought to have one of the rare cortical blade production sites in southwest Asia (Müller-Neuhof 2013: 229; Wright 1981:43). These blades were used in animal processing activities such as sheep shearing and hide working (Barkett and Bell 2011; Henry 1995:372). Pollock determined that medium gray chert found at Sharafabad[19] was sourced to Tepe Farukhabad, and fine mottled and banded reds are likely from the Deh Luran Plain (Pollock 2008: 50). Melody Pope found that at Abu Salabikh, 80% of chipped medium gray chert and fine mottled tan and gray chert came from Tepe Farukhabad (Pope 1994:137). Chert artifacts have provided some of the strongest evidence for regional transport from the Deh Luran Plain, and Tepe Farukhabad specifically, but further geochemical

[18] Resources noted as being in high frequency on the plain include timber, local chert, limestone slabs, and gypsum (Wright 1981:265–278; Wright and Johnson 1975:279). Miller (2011:4) comments on the quality of wood, stating: "At Farukhabad, the very small quantity of wood reflects its location in the more arid steppe-forest—the charcoal was mostly tamarisk, which is not even a woodland species, but rather one which typically grows along streams and in wet areas."

[19] Pollock (2008:54) reports: "Medium Grey chert was preferred above all others for these tools, with 84% of Sharafabad sickle blades made on this material. A similar preference is evident at Uruk period Farukhabad and also at Abu Salabikh, despite the fact that Abu Salabikh is quite distant from any source of Medium Grey chert."

proveniencing is needed for the Mesopotamian region as a whole to better understand the movement of chert (Müller-Neuhof 2013:234).

Bitumen[20] was also more assuredly transported over distances (Schwartz et al. 1999, Schwartz and Hollander 2008; Wright 2016). Much has been made of bitumen as an important trade item. Bitumen from Tepe Farukhabad was the closest source to Susa (Marschner et al. 1978; Wright 1981; Wright and Johnson 1975). Ancient people desired bitumen as an adhesive for construction, crafting, and waterproofing. Though there is little evidence that the people of the Deh Luran used the bitumen much themselves, "the density of the fragments is a useful indicator of export" (Wright and Johnson 1975:277). Robert Marschner, Leo Duffy, and Henry Wright tested bitumen samples from Ain Gir, also located on the Deh Luran Plain, and compared them to several samples in southwestern Iran, including Tepe Farukhabad. More than half of the samples used in their study came from Tepe Farukhabad (Marschner et al. 1978:100). They traced bitumen from Ain Gir to the Susiana Plain and the Deh Luran in the Middle and Late Uruk. They found that by 3200 BCE, the Deh Luran was supplied by a local Ain Gir bitumen source, and that the Susiana Plain was supplied in part by a similar source (Marschner et al. 1978:110). They examined partially prepared bitumen from several sites on the Deh Luran Plain and determined that the density and scarcity of the bitumen artifacts suggests that asphalt was processed on the plain and transported elsewhere (Marschner et al. 1978:100). Recent archaeometric analysis supports bitumen as the most likely item to have been transregionally exchanged, though chemical analysis has yet to place the Deh Luran as source of this trade (Marschner et al. 1978:277; Schwartz and Hollander 2008; Schwartz et al. 1999; Wright 2016).

[20] Schwartz, Hollander, and Stein tested nine bitumen samples, along with samples from 12 other sites, against samples from Hacinebi in an attempt to find the source (Schwartz et al. 1999:71). The bitumen was determined to come from Latakiya in the west and Tepe Gawra in the east (Schwartz et al. 1999:82).

These updated findings buoy the earlier conclusions that cherts and bitumen were exported from Tepe Farukhabad.

Archaeometric advances have clarified the interactions and relationships among Mesopotamia's key players in the fourth millennium BCE. But does the faunal assemblage independently support the view of Tepe Farukhabad as a hub for animal trade in addition to the resources outlined by Wright, and how do the zones outlined within households and public spaces illuminate the animal economy employed at Tepe Farukhabad?

The assumption of long-distance trade within a world systems network neglects the possibility that exchange may be enjoyed by both parties, and that a producing population may be the benefactor of exchange (Stein 1999b:157). Despite recent sourcing of proposed exchange items, Tepe Farukhabad is still seen as facilitating administration. And in more recent publications, Wright asserts that the sites on the Deh Luran Plain were likely in subordination to a core. He contends that there is evidence the Tepe Farukhabad was exploited by stronger polities for the extraction of Deh Luran flint, bitumen, and animal products with relatively little returned in exchange (Wright 2013).

ANIMAL PRODUCT TRADE AT TEPE FARUKHABAD

Live animals on the hoof, meat, hides, wool, and dairy were proposed as the third most likely "prime export" items from Tepe Farukhabad (Wright 1981:265-266). The model used to evaluate the animal economy focuses on meat production and consumption (Wapnish and Hesse 1988, Wattenmaker and Stein 1986). But Wright proposed other export possibilities that come from animals. These items may have been traded whether raw or processed outside of the village.

Redding identified an intensification of milk production in the Jemdet Nasr phase (Wright 1981:271) with male juveniles being slaughtered (Redding 1981:250) leaving a largely female herd. This may have begun in the Uruk Phases and milk cannot be ruled out as an export cannot be ruled out. The absence of sheep horn cores may indicate a largely hornless, and hence predominantly female, flock throughout the phases at Tepe Farukhabad (Redding 1981:245–252).

Hides also remain a possibility for export with at least one bale sealing (x299, 60203) having a hide impression (Wright 1981:271). However, there is little support from the body part distribution for large-scale hide production and export at Tepe Farukhadbad. Wool and textiles are a stronger possibility for export. A larger number of caprines than is typically found in a meat producing system survived beyond three years. Redding found that males were retained at higher percentages than they are in modern herding populations (1:10 to 1:50). A delayed culling for males is more suggestive of a wool secondary product strategy (Payne 1973). Based on the evidence from Tepe Farukhabad, in the Middle Uruk Phase, secondary animal products became increasingly important.

At Tepe Farukhabad, three varieties of spindle whorls from the Middle Uruk phase provide evidence of a textile industry in the village. And there was a correlation between an increase in the number of whorls with an increase in the proportion of sheep and goats in the faunal assemblage (Wright 1981:50–51). At Tepe Farukhabad, whorls were relatively common in the Early and Middle Uruk phases, but entirely disappeared in the Late Uruk (Wright 1981: 271, 276). Wright drew a correlation between the increased in caprines and spindle whorls with import and exporting (Moghaddam 2012:527, Wright 1981: 156, 267, 274-5). In the Late Uruk,

there were possible loom weights, but none of these were confirmed. The absence of confirmed spindle whorls led to speculations about imported cloth during the later periods.

It is often assumed that maintaining many adult sheep is indicative of a wool economy (Payne 1973); individuals are kept alive longer to maximize the number of shearings. However, there may be other strategies that would maintain sheep into old age. The association of spinning and weaving paraphernalia is a better line of evidence for wool production (Sykes 2014:43), though raw wool may have been traded as well. Wright believes that goat hair was emphasized and processed elsewhere stating, "there is a shift to goats, but a decline in evidence of local weaving, suggesting that the goat hair was shipped for final processing elsewhere" (Wright 1981: 276). I cannot speak to this topic because I lumped the caprines together for this analysis.

Porter (2012) has argued that immigrants to the hinterlands, and smaller villages like Tepe Farukhabad, were connected through the expansion of animal husbandry. The newly arriving immigrants may have been expanding to meet the demands of the textile industry. Porter interprets evidence for a textile industry and textile production by mobile pastoral craftspeople as the impetus for the Uruk expansion and the exchange of culture (Porter 2012); the presence of a textile industry at Tepe Farukhabad may support this claim. Porter (2012:146) explains "my reconstruction does not require a highly centralized and coordinated polity with the resources to accomplish territorial or economic expansion... at this juncture political concerns were still largely in the hands of the community." It is possible that if Tepe Farukhabad does not reflect the profile of a meat supplying economy (shipping meat to a consuming urban population) secondary products such as wool could have been the focus of trade instead as well as the impetus for cultural exchange as Porter (2012) has argued.

CONCLUSION

This reanalysis of the faunal data suggests that meat as an export from Tepe Farukhabad may have been overstated or at least should be reevaluated, and in conjunction with the instrumental neutron activation analysis (INAA) on the ceramics and seals in the region, there is little evidence of wholesale exchange in general (Pittman and Blackman 2016:877). In Blackman's analysis of clay seals, he concludes that "although iconographic parallels exist… little direct trade in sealed goods can be documented by the clay compositional data" (Blackman 1985:168). Trade relations were likely less formal than has been inferred. An *a priori* reading of the significance of Uruk administrative technology elevated Tepe Farukhabad's status within the region. I argue that Tepe Farukhabad's role as an administrative center and exporter should be reexamined.

Not enough evidence has been recovered to argue that Tepe Farukhabad played as large a role in transport and exports as was previously put forth. The emphasis on the village as a small center was in large part due to its access to resources and its location on the plain (Wright 1981:271). Yet most of the resources at Tepe Farukhabad are found to be local.[21] Tepe Farukhabad was likely not a very exceptional nor influential village on the plain. The village's isolated position on the plain was noted, yet the site was framed as a small administrative center in the region based on a relatively small assemblage from two moderate-size step trenches and a third small trench along the top of the tell (Wright 1981:188, 264). The community living at Tepe Farukhabad was familiar with the administrative practices of the Uruk collective culture;

[21] Even the presence of a ray at Tepe Farukhabad is not believed to necessarily denote trade, as marine animals are known to have swum up the Tigris (Redding 1981:234).

that has been established. But It does not follow that the mere presence of materials establishes Tepe Farukhabad as an outpost.

Indeed, beveled-rim bowls and other Uruk-type artifacts were recovered at Tepe Farukhabad. These artifacts traditionally placed a site within the Uruk world, but Porter (2012) and Potts (2009) remind us that beveled-rim bowls are found across Mesopotamia and as far away as Afghanistan. Potts warns that "[we need to] rethink our approach to [beveled-rim bowls] and to stop looking at them as non-indigenous, intrusive elements in the many local ceramic traditions in which they appear" (Potts 2009:12). The presence of these items alone does not preclude their self-sufficiency.

Porter observed that "the fact is that the recognition of a phenomenon that might be labeled 'Uruk' is no more or less than the recognition of a set of material attributes that had a point of origination and a sphere of distribution in space rendered visible against a backdrop of difference" (Porter 2012: 80). One possibility is that this difference is merely evidence of the exchange of ideas and procedures. Shared material culture may merely be mutually beneficial and a useful accounting system (Flannery and Marcus 2012:465; Frangipane 1997). Much is inferred from the use of a common accounting system concerning incorporation into a larger system or even identity.

The use of legacy data, in conjunction with the recent clay sourcing, has reframed Tepe Farukhabad's status in the Uruk world. Even with limited and flawed data, a new perspective can be proposed. Archaeologists can reexamine data to reveal more localized details about the interworking of a community and households. This thesis demonstrates that: (1) data from already published assemblages can and should be reworked through new zooarchaeological analyses for a deeper understanding and finer-tuned view into a society, and (2) room-to-room

and space-to-space faunal analyses can provide new interpretations of site trends and cultural change over time and through space.

Future zooarchaeological studies at Tepe Farukhabad and in Mesopotamia at large with updated methodological approaches will refine our understanding of the Uruk period in this region. A revised look at tooth wear and epiphyseal fusion will be particularly helpful. Faunal assemblages lie languishing in institutions that up-and-coming scholars may reanalyze; a renewed effort to investigate the Urukian human-animal relations can only further our understanding of the relationships these communities had within and beyond the region.

APPENDIX
EARLY URUK NISP BY ZONE

Table 13: NISP for Zone UA1-Green

UA1-Green				
	O/C	*Gazella subgutturosa.*	*Equus sp.*	totals
tooth fragment	1			1
upper tooth	1			1
humerus	1			1
astragalus	1		2	3
calcaneus			1	1
central tarsal			2	2
third tarsal			1	1
fourth tarsal			1	1
metapodial III+IV		1		1
first phalanx	1			1
totals	5	1	7	13

Table 14: NISP for Zone UA2-Blue

UA2-Blue					
	O/C	*Bos sp.*	*Equus sp.*	*Canis sp.*	total
tooth fragment	1				1
upper tooth			5		5
lower tooth	2	1	1		4
humerus	2				2
radius	1				1
fourth carpal	1				1
femur	5				5
patella			2		2
tibia	3				3
astragalus			1		1
calcaneus			1		1
central+fourth tarsal	2	1			3
third tarsal			1		1
fourth tarsal			1	1	2
metatarsal III+IV	2				2
metapodial III+IV	5				5
second phalanx	1				1
third phalanx	1				1
total	26	2	12	1	41

Table 15: NISP for Zone UA3-Yellow

UA3-Yellow			
	O/C	*Canis sp.*	totals
tooth fragment	2		2
upper tooth	1		1
lower tooth		1	1
pubis	1		1
first phalanx	3		3
second phalanx	1		1
totals	8	1	9

Table 16: NISP for Zone UA4-Orange

UA4-Orange				
	O/C	*Equus sp.*	*Hyaenidae*	total
skull	1			1
tooth fragment	1			1
upper tooth	1			1
lower tooth	1			1
humerus	1			1
pelvis			1	1
femur	1			1
tibia	2			2
astragalus	1			1
MT III+IV	1	1		2
total	10	1	1	12

MIDDLE URUK TRENCH A NISP BY ZONE

Table 17: NISP for Zone UB1-Lime

UB1-Lime	
	O/C
lower tooth	4
metapodial III+IV	2
total	6

Table 18: NISP for Zone UB2-Brown

UB2-Brown	
	O/C
tooth fragment	1
upper tooth	2
lower tooth	1
ulna	1
ulnar carpal	1
second+third carpal	1
patella	1
first phalanx	1
totals	9

Table 19: NISP for Zone UB3-Aqua

UB3-Aqua		
	O/C	*Equus sp.*
femur	1	
first phalanx		1

Table 20: NISP for Zone UB5-Pink

UB5-Pink	
	O/C
upper tooth	1
lower tooth	1
humerus	1
ilium	1
pubis	1
astragalus	1
total	6

Table 21: NISP for Zone UB4-White

UB4-White				
	O/C	*Gazella subgutturosa*	*Equus sp.*	totals
tooth fragment	2			2
upper tooth			1	1
lower tooth	2			2
horn core	6			6
humerus	3			3
radius		1		1
radial carpal			1	1
femur	5			5
patella	1			1
tibia	2			2
astragalus	2			2
calcaneus	1	1		2
MT III+IV	2			2
metapodial III+IV			1	1
first phalanx	2		1	3
third phalanx	1			1
totals	29	2	4	35

MIDDLE URUK TRENCH B NISP BY ZONE

Table 22: NISP for Zone UC1-Purple

UC1-Purple				
	O/C	*Gazella subgutturosa*	*Equus sp.*	totals
skull	3			3
tooth fragment	13			13
upper tooth	9		1	10
lower tooth	18		1	19
axis	1			1
scapula	1			1
humerus	2	1		3
radius		1		1
radial carpal	1			1
metacarpal III+IV	1			1
ilium	1			1
ischium	1			1
pubis	1			1
femur	2			2
patella	1			1
tibia	2			2
calcaneus	2	1		3
central tarsal			1	1
central + fourth tarsal	1			1
metatarsal III+IV	1			1
metapodial III+IV	3			3
first phalanx	4			4
second phalanx	2			2
third phalanx	1			1
totals	71	3	3	77

Table 23: NISP for Zone UC2-Red

UC2-Red						
	O/C	*Gazella subgutturosa*	*Bos sp.*	*Equus sp.*	*Canis sp.*	Totals
skull	6	4		1	2	13
tooth fragment	8					8
upper tooth	3			2		5
lower tooth	5			3		8
horn core		1				1
atlas			1			1
scapula	1				1	2
humerus	6			1		7
radius	3			2		5
ulna	1			2		3
radial carpal	1					1
pelvis				1		1
ilium				1		1
femur	8				1	9
tibia	2			2	2	6
astragalus	2			1		3
calcaneus	3			1		4
central tarsal					1	1
third tarsal					1	1
fourth tarsal						
MT III					1	1
MT V					1	1
MT III+IV	1					1
indeterminate metapodial				1		1
first phalanx	5		1			6
second phalanx	2					2
third phalanx	1					1
totals	58	5	2	18	10	93

LATE URUK TRENCH A NISP BY ZONE

Table 24: NISP for Zone UD1-Gray

UD1-Gray				
	O/C	*Equus sp.*	*Canis sp.*	totals
tooth fragment	1			1
upper tooth	3			3
lower tooth	1			1
axis	2			2
humerus	2			2
femur			3	3
tibia	1			1
lateral malleolus	1			1
first phalanx	4			4
second phalanx	4			4
third phalanx		1		1
totals	19	1	3	23

Table 25: NISP for Zone UD2-Violet

UD2-Violet			
	O/C	*Equus sp.*	totals
tooth fragment	2		2
upper tooth	2		2
lower tooth	2		2
vert	1		1
ischium	1		1
astragalus	1		1
third phalanx	1		1
phalanx		1	1
totals	10	1	11

LATE URUK TRENCH B NISP BY ZONE

Table 26: NISP for Zone UE1-Forest

UE1-Forest			
	O/C	*Bos sp.*	totals
skull	1		1
upper tooth	1		1
lower tooth	2		2
verts	1		1
humerus	1		1
femur	3		3
tibia	1		1
astragalus	1		1
sesamoid		1	1
first phalanx	1		1
totals	12	1	13

Table 27: NISP for Zone UE2-Magenta

UE2-Magenta					
	O/C	*Gazella subgutturosa*	*Bos sp.*	*Equus sp.*	totals
skull	9				9
tooth fragment	14			2	16
upper tooth	15			1	16
lower tooth	13		2		15
axis	2				2
scapula	1				1
humerus	6			1	7
radius	4				4
ulna	2				2
fourth carpal	1				1
ilium	3				3
ischium	2				2
pubis	3				3
femur	2				2
tibia	3				3
astragalus	4				4
calcaneus	5				5
MT III+IV	1				1
metapodial III+IV	5	1			6
sesamoid	1			1	2
first phalanx	11				11
second phalanx	5				5
third phalanx	4				4
totals	114	1	2	5	122

Table 28: NISP for Zone UE3-Gold

UE3-Gold			
	O/C	*Equus sp.*	totals
tooth fragment	4	1	5
upper tooth	8	1	9
lower tooth	4		4
humerus	1		1
ulna	1		1
radial carpal	1		1
second+third carpal	1		1
femur	1		1
tibia	2		2
astragalus	1		1
metapodial III+IV		1	1
sesamoid	1		1
first phalanx	2		2
second phalanx	3		3
third phalanx	1		1
totals	31	3	34

Table 29: Early Uruk Tooth Wear

Early Uruk: Trench B							
Unit #	Color	Taxa	Tooth	Wear (Redding 1981)	Group (Zeder 2006)	Age (Zeder 2006)	Age
594.3	blue	No ID	upper M3	wearing	17/VII-VIII	4-8y	adult
566.10.	blue	*O/C*	upper M1or2	wearing	17/IV-VII	3-8y	adult
566.11	blue	*O/C*	upper M1or2	wearing	17/IV-VII	3-8y	adult
595.3	blue	*O/C*	upperM1or2	wearing	17/IV-VII	3-8y	adult
588.5	blue	*O/C*	lower M1or2	wearing	17/IV-VII	3-8y	adult

Table 30: Middle Uruk Tooth Wear

Middle Uruk: Trench A							
Unit #	Color	Taxa	Tooth	Wear (Redding 1981)	Group (Zeder 2006)	Age (Zeder 2006)	Age
378.5	brown-lime	*O/C*	upper M1	wearing	17/IV-VI	1-4y	juvenile-adult
378.6	brown-lime	*O/C*	upper M2	wearing	17/V-VII	2-6y	juvenile-adult
381.5	brown	*O/C*	M	worn	25/VI-IX	3-10+	subadult-adult
327.4	lime	*O/C*	tooth unknown	wearing	17		?
379.3	lime	*O/C*	lower M1or2	wearing	17/IV-VII	1-6y	juvenile-adult
337.4	white	*O/C*	lower M3	wearing	17/VII-VIII	4-8y	adult
314.5	white	*O/C*	upper M3	wearing	17/VII-VIII	4-8y	adult
Middle Uruk: Trench B							
Unit #	Color	Taxa	Tooth	Wear (Redding 1981)	Group (Zeder 2006)	Age (Zeder 2006)	Age
467.4	purple	*O/C*	upper M3	wearing	17/VII-VIII	4-8y	adult
467.5	purple	*O/C*	upper M3	wearing	17/ViI-VIII	4-8y	adult
509.14	purple	*O/C*	upper M1or2	wearing	17/IV-VII	3-8y	subadult-adult
509.16	purple	*O/C*	upper M3	worn	25/IX	8-10+y	adult
509.17	purple	*O/C*	upper M3	worn	25/IX	8-10+	adult
515.8	purple	*O/C*	lower M1or2	wearing	17/IV-VII	3-8y	subadult-adult
515.9	purple	*O/C*	lower M1or2	wearing	17/IV-VII	3-8y	subadult-adult
460.6	purple	*O/C*	lower M3	wearing	17/VII-VIII	4-8y	adult
463.3	purple	*O/C*	lower M1or2	wearing	17/IV-VII	3-8y	subadult-adult
467.6	purple	*O/C*	lower M1or2	wearing	17/IV-VII	3-8y	subadult-adult
477.2	purple	*O/C*	lower M3	worn	25/IX	8-10+y	adult
509.10.	purple	*O/C*	lower M1or2	wearing	17/IV-VII	3-8y	subadult-adult
509.11	purple	*O/C*	lower M1or2	wearing	17/IV-VII	3-8y	subadult-adult
509.12	purple	*O/C*	lower M1or2	wearing	17/IV-VII	3-8y	subadult-adult
509.13	purple	*O/C*	lower M1or2	wearing	17/IV-VII	3-8y	subadult-adult
528.4	purple	*O/C*	lower M1or2	worn	25/VI-IX	3-10+y	subadult-adult
526.13	red	*O/C*	upper M1or2	wearing	17/IV-VII	3-8y	subadult-adult
559.9	red	*O/C*	upper M1or2	wearing	17/IV-VII	3-8y	subadult-adult
563.7	red	*O/C*	lower M1or2	wearing	17/IV-VII	3-8y	subadult-adult
563.8	red	*O/C*	lower M3	wearing	17/VII-VIII	4-8y	adult
511.11	red	*O/C*	lower M3	wearing	17/VII-VIII	4-8y	adult
559.10.	red	*O/C*	lower M1or2	worn	25/VI-IX	3-10+y	subadult-adult

Table 31: Late Uruk Tooth Wear

Late Uruk: Trench A							
Unit #	Color	Taxa	Tooth	Wear (Redding 1981)	Group (Zeder 2006)	Age (Zeder 2006)	Age
293.6	gray	*O/C*	upper M1	worn	25/VI-IX	3-10+y	subadult-adult
295.2	gray	*O/C*	upper M1or2	wearing	17/IV-VII	3-8y	subadult-adult
392.5	violet	*O/C*	upper M1or2	wearing	17/IV-VII	3-8y	subadult-adult
300.3	violet	*O/C*	lowerM1or2	wearing	17/IV-VII	3-8y	subadult-adult
Late Uruk: Trench B							
Unit #	Color	Taxa	Tooth	Wear (Redding 1981)	Group (Zeder 2006)	Age (Zeder 2006)	Age
432.4	forest-gold	*O/C*	upper M3	worn	25/IX	8-10+y	adult
421.6	forest	*O/C*	upper M1or2	wearing	17/IV-VII	3-8y	subadult-adult
401.3	forest	*O/C*	lower M1or2	worn	25/VI-IX	3-10+y	subadult-adult
421.4	forest	*O/C*	lower M3	wearing	17/VII-VIII	4-8y	adult
421.5	forest	*O/C*	lower M3	wearing	17/VII-VIII	4-8y	adult
353.5	gold	*O/C*	upper M1or2	worn	25/VI-IX	3-10+y	subadult-adult
355.5	gold	*O/C*	upper M1or2	worn	25/VI-IX	3-10+y	subadult-adult
393.6	gold	*O/C*	upper M1or2	wearing	17/IV-VII	1-6y	juvenile-adult
404.3	gold	*O/C*	upper M1or2	worn	25/VI-IX	3-10+y	subadult-adult
433.3	gold	*O/C*	lower M3	worn	25/IX	3-10+y	subadult-adult
319.5	magenta	*O/C*	upper M3	worn	25/IX	3-10+y	subadult-adult
319.6	magenta	*O/C*	upper M3	worn	25/IX	3-10+y	subadult-adult
319.6	magenta	*O/C*	upper M1	worn	25/IX	3-10+y	subadult-adult
349.4	magenta	*O/C*	upper M1or2	really worn	26/IX	8-10+y	adult-senile
350.10.	magenta	*O/C*	upper M3	wearing	17/VII-VIII	4-8y	adult
350.11	magenta	*O/C*	upper M?	wearing	17/IV-VIII	1-8y	juvenile-adult
362. 11	magenta	*O/C*	upper M1or2	wearing	17/IV-VII	1-6y	juvenile-adult
362.12	magenta	*O/C*	upper M3	worn	25/IX	3-10+y	subadult-adult
364.10.	magenta	*O/C*	upper M1or2	wearing	17/IV-VII	1-6y	juvenile-adult
399.9	magenta	*O/C*	upper M1or2	worn	25/VI-IX	3-10+y	subadult-adult
350.14	magenta	*O/C*	lower M1or2	worn	25/VI-IX	3-10+y	subadult-adult
481.8	magenta	*O/C*	lower M1or2	wearing	17/IV-VII	1-6y	juvenile-adult
481.9	magenta	*O/C*	lower M2	wearing	17/V-VII	2-6y	subadult-adult
341.6	uknown	*O/C*	lower M1or2	wearing	17/IV-VII	1-6y	juvenile-adult

Table 32: Uruk Tooth Eruption and Light Wear

Early Uruk: Trench B					
Unit #	Color	Taxon	Tooth	Eruption/Wear (Redding 1981)	Age (Meadown 1975)
575.3	blue	*Equus sp.*	upper Mx or PMx	unerupted	young
575.7	blue	*Equus sp.*	upper Mx or PMx	unerupted	young
Middle Uruk: Trench A					
Unit #	Color	Taxon	Tooth	Eruption/Wear (Redding 1981)	Age (Meadown 1975)
381.4	brown	*O/C*	2 upper PM 2-4	little worn	infantile-juvenile
340.4	lime	*O/C*	PM 3or4	unerupted	infantile-juvenile
329.4	white	*O/C*	M1 or 2	little worn	infantile-juvenile
Middle Uruk: Trench B					
Unit #	Color	Taxon	Tooth	Eruption/Wear (Redding 1981)	Age (Meadown 1975)
509.15	purple	*O/C*	upper M3	just erupted	ca. 18 months
533.8	red	*Equus sp.*	lower Mx	just erupted	young
Late Uruk: Trench B					
Unit #	Color	Taxon	Tooth	Eruption/Wear (Redding 1981)	Age (Meadown 1975)
359.4	gold	*O/C*	upper PM2 or DPM2	possible DPM2	?
368.7	forest	*O/C*	lower DPM4	DPM4	infantile-juvenile
396.7	magenta	*Bos sp.*	lower M1or2	little worn	infantile-juvenile

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